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## Moderate Activity in Finished Steel

### Lower Prices on Northern Pig Iron

## Further Car and Locomotive Orders—Record Tin Plate Production

The first half of June has brought more new business to the books of the large producers of finished steel than the corresponding period in May, yet the failure of demand to measure up to capacity is still the commanding feature of the situation. Pig iron has touched new low levels in the past week, and that market is paying little attention to the periodic announcements that costs of certain producers have been reached on the way down. The surprising thing in this connection is that the furnaces which cannot stand the pace are not blowing out.

Competition for the few large pig iron orders that have come out has been particularly sharp among Northern furnaces. Most Southern sellers seem to be holding to \$12, Birmingham, for fourth quarter iron, while \$11.50 is commonly done for June and third quarter delivery. Sales of foundry iron in New England have attracted attention for the low level reached, one 10,000-ton lot bringing out a cut of 50c. below recent prices. In the Pittsburgh district a purchase of 15,000 tons of No. 2 foundry and forge by one interest was at the lowest price of the year, and for the forge iron the lowest price in 12 months.

Of steel making iron 15,000 tons was bought by a Shenango Valley steel foundry on a sliding scale. A producer of crucible steel is in the market for 15,000 to 20,000 tons of basic for the year beginning July 1.

Reports persist that Bessemer billets have sold at \$25, Pittsburgh, but the usual minimum is \$25.50, while open hearth billets are held at \$28.

Further evidences appear of concessions on structural material and plates. New business in both lines is rather better, but in Eastern markets, particularly in eastern Pennsylvania, more aggressiveness has been shown by one or two interests. The Kentucky and Indiana bridge at Louisville, 15,000 tons; the M. K. & T. bridge, 3000 tons, and steel buildings for the International Harvester Company, 3000 tons, are the principal contracts awarded. A considerable tonnage will be required for the new steel plant at Duluth, which the United States Steel Corporation has decided to build as rapidly as possible. The June total of structural steel promises to exceed that for May, which was greater than that for May, 1909.

Between 30,000 and 40,000 tons of plates have been

taken by Pittsburgh and Eastern mills for gas and oil pipe lines in the West. Bids have just been opened at Washington for the construction of the Panama Canal lock gates, which will require about 57,000 tons of plates and other riveted work.

The Baltimore & Ohio has ordered 2500 cars, and is in the market for 2000 to 3000 all steel coke cars and 2000 to 5000 steel underframe box cars. The Hawley lines have inquired for 5000 cars. The largest locomotive orders announced this week are 65 for the Chicago, Burlington & Quincy and 85 for the Harri-man lines.

In sheets there is some falling off in demand and competition is sharper. The premiums recently asked for blue annealed electric and stamping sheets have disappeared.

June is expected to make a new record in tin plate production. A total of 33 new hot mills have been put in operation in recent weeks by independent producers.

Copper has declined further, but at 12.50c. for electrolytic there has been little buying. Imports for June thus far have been almost equal to exports, and there are no signs of a better equilibrium between production and consumption.

### Vitality of the Valley Furnaces

Prices recently made by Mahoning and Shenango valley furnaces have drawn attention to the competitive position, for these prices are below the cost of production to furnaces which must buy their coke and ore in the open market. In some quarters it is even said that "the day of the merchant furnace in the valleys is over." We quote the words because a similar suggestion was being made with confidence in the late nineties, but was promptly tabled by the boom of 1899, which gave the valley furnaces about \$25 for some of their iron.

The valley furnaces have had an interesting career, and, on the whole, a prosperous one, although as in other branches of the iron trade there have been many wrecks. The third directory compiled by the American Iron and Steel Association, and the first, under the management of Mr. Swank, appeared in 1874. It lists for the Shenango Valley 31 blast furnaces, and for the Mahoning Valley 28, a total of 59. Our present list shows 20 for the Shenango and 22 for the Mahoning Valley, a total of 42. The decrease in number, of course, is not out of keeping with the general trend of the industry, for the average output per furnace has increased more rapidly than the total output of the country. The directory of 1874 listed 681 blast furnaces. Our list of coke and anthracite furnaces, used in compiling the monthly report of production, contains 413 furnaces, while the American Iron and Steel Association's last report showed 49 charcoal furnaces in existence December 31 last, making a total of 462 furnaces in existence now, as compared with 681 in 1874.

The valley pig iron market has declined steadily, although slowly, since last November. The passage into a new ore season, with prices 50 cents a ton above those of 1908 and 1909, has not served to arrest or even retard the decline, and the result has been that

prices in some recent transactions are held to represent an actual loss of approximately \$1 a ton to furnaces which must buy their ore and coke in the open market. There are valley furnaces which are strictly in that position, and there are others which own outright and operate coke and ore properties, either or both, sufficient for their entire requirements. Of these latter there are relatively few, but between the extremes there are a number of furnace operations which have various degrees of interest in ore. Each, then, has its own basis of cost. To assume a case, and avoid suggestive figures, a furnace may have a quarter interest in an ore mine. If it draws its entire supply from that mine, and there is a loss of 10 cents a ton in making pig iron and a profit of 20 cents a ton in mining ore, it breaks even, for, while it loses 10 cents on the ton of pig iron, there is a profit of 40 cents in the two tons of ore involved, and of this 40 cents it receives 10 cents.

The vitality of the valleys as a pig iron producing district has been due to their very advantageous geographical position, as they are almost in the center of the most important pig iron consuming territory in the world. Repeatedly they have suffered losses of trade which to districts having fewer channels of distribution would have been fatal, only to find customers in a new direction. Within the space of two years in the middle eighteen-nineties the Carnegie Steel Company bought the two Carrie furnaces and built and blew in the four Duquesne furnaces, and from being a large and regular buyer became a small and occasional buyer. Other large buyers appeared and disappeared. The Ohio Steel Company at Youngstown made steel from 1895 to 1900 from purchased valley pig iron, having no furnaces of its own until the later year. The Johnson Company at Lorain, Ohio, made steel from 1895 to 1899 without furnaces of its own, in a period when there was only one merchant furnace on the lake front of Ohio, so that naturally it was a large user of valley iron.

These and other steel works customers of the valleys disappeared by the beginning of the present century. They have been replaced in large part by the basic open hearth steel works which have sprung up in tributary territory, while other Bessemer steel works have appeared as buyers, only to disappear again. Thus the Youngstown Sheet & Tube Company began making steel in August, 1906, from outside pig iron, but having built two blast furnaces has now completed a third and commenced the erection of a fourth. The Republic Iron & Steel Company was for years a fairly steady buyer, but its purchases have now dwindled to almost insignificant proportions. The spectacular purchases in the second half of last year of these and other companies, like Lackawanna, Cambria and Jones & Laughlin, are not likely to be repeated, but it is by no means a new experience for the valleys to lose important custom.

In the foundry iron trade the valleys have met fresh competition of an important character in the last few years, particularly by the building of merchant furnaces on the shore of Lake Erie. These have served to prevent the valleys from penetrating to New England territory as they formerly could.

The railroads are known to be quite expert in adjusting freight rates to the profitableness of the business, and the rates charged the valleys therefore sug-



gest a high state of prosperity. On Connellsville coke the valleys pay practically 1 cent per net ton-mile, and on ore from Lake Erie about 1 cent per gross ton-mile; while pig iron from the valleys to Cleveland and Pittsburgh commands almost  $1\frac{1}{2}$  cents per gross ton-mile. Another suggestion of a view that the valleys are well able to pay was furnished by the case of divisions to terminal railroads. When those divisions flourished there was not a blast furnace in Allegheny County which did not have its terminal railroad, receiving a very comfortable "division"—which was practically a rebate—while divisions to terminal railroads in the valleys were practically unknown.

### Getting the Best Results from Men

The Japanese have a saying, which, like many Japanese things, is doubtless of exceeding antiquity, that

To get the best results from men, overlook little faults in them.

Maxims such as this throw light on human nature, opening up a vast deal of matter well worth sober reflection. The complexities and the ever differing phases it presents to us are bewildering. Most of our "big men" will unreservedly admit that their success is attributable in great measure to an understanding of their fellow men, especially of those whose behavior they control to a greater or less extent.

When we engage the services of a "human machine," we always have certain duties laid out which the newcomer is expected to undertake, and we try to get the best man for the place. Having engaged him, we set him to work and anxiously watch results. Has he ordinary or exceptional intelligence? Is he energetic, careful, calm under trying circumstances? In short, has he the right sort of stuff in him? If not, we look elsewhere.

Now, when we purchase a machine tool and find it slightly unfitted for requirements, we can usually make a change in construction, which will correct the difficulty. We do not find it necessary to "overlook little faults" in it. Why? Because the machine tool is never supersensitive; it is never obstinate, perverse, discouraged.

If the human machine could be controlled by the set rules that govern machine tool operation, the world would be a much different place. Now, we must have our expensive Government, our expensive business organizations. All because we can't tell this minute what half the people are going to do the next.

Of all costs, labor cost is usually greatest; moreover, the greater part of the running expenses of most businesses is the supervising expense. Good money is paid to some people to see that other people do their allotted tasks correctly. Consequently, the supervising expense should command gravest consideration when conducting a "greater efficiency" campaign, which brings us back again to the Japanese maxim.

There will be hardly a dissenting voice if we make the statement that

To get the best results from men, offer inducements commensurate with the cost to them of maximum effort.

To expect men to do their utmost by simply driving them machine tool fashion, is contrary to human nature and pretty well understood to be so to-day. Admission of the fallacy of this driving method is not, however, sufficient to get the results all manufacturers

want; the pendulum must swing to the other end of the arc—the force must be attraction instead of propulsion.

How, then, is the employer to do all this? How shall he plan and act that his employees will gladly, cheerfully exert themselves to the utmost for the enterprise in which their efforts are combined?

Whoever has witnessed an intercollegiate boat-race has noticed how at the finish the crew of one boat will collapse, while those in the other boat row on without one faltering stroke. Both crews may have done the same amount of work; nay, the winning crew may have done a shade more work than the losers; why, then, the marked difference in physical and mental condition? In business a great many of us row a race every day, and we know that our condition at the end of to-day's race has a great deal to do with our speed in to-morrow's race. Who, then, that employs men to "race" for him will deny that it is to his best interests to have his men feel that they have won at the end of each day's race?

There are many ways of accomplishing this, as many ways as there are different men and women. Some of them are well-known ways; others, though understood by our Columbuses, our Hannibals, our Napoleons, remain enigmas to most of us still. Perhaps the best known and most frequently practiced means is the provision of inducements affecting the worker's finances or ambitions; an ever present knowledge of sure reward or promotion does more to bring the result sought for than anything else to be named.

Next in power comes, perhaps, the comfortable sense of satisfaction felt by a workman in knowing that his employer is worthy of his respect and his best effort. Then, too, there is the intimately sympathetic and cheerfully enthusiastic employer who, because he is what he is and because he has made his workmen his friends, calls out from them unasked the daily sweat of their faces.

To the healthy human being it is good to work and to work hard, when his work is made pleasant for him and when he is paid at least the market value for his efforts. Otherwise he becomes the unwilling horse, the oarsman with a broken oar, and even an enemy in the camp.

### Profit Sharing and Leased Machinery

The machinery trade is following closely the shoe machinery industry, not only because it is a large customer at the present time, but because it promises to become a still more important factor with the development of the independent companies. The business is undergoing a rapid evolution. The present period is believed to be developing more radical changes than any since the consolidation of the concerns controlling practically all of the important patents into the United Shoe Machinery Company, with the consequent establishment of the principle of leased shoe machinery. This company sells no machines outright. Its customers, who include a very large percentage of the shoe manufacturers of this and other countries pay rental based, for the most part, upon production. The claim of the exponents of the system is that the conditions of the machinery lease have become less onerous as time has gone on. The latest concession to the users is set forth in an announcement just received by them from the United Shoe Machinery Company of a profit shar-

ing plan in which they will participate. The terms follow:

Beginning with January 1, 1910, the company will create a fund by investing each year, for three years, in the common stock of the United Shoe Machinery Corporation a percentage, increasing each year, of the amounts received from its lessees for the use of its Goodyear welting, Goodyear stitching and Goodyear turn sewing machines in the United States, and will add to that fund from time to time the dividends which shall have been paid in the meantime upon such stock, or shares of the common stock of the corporation purchased with such dividends. At the end of three years from that date it will distribute the entire amount of stock held in the fund among those lessees who use the Goodyear welting, Goodyear stitching and Goodyear turn sewing machines in the United States and who shall have faithfully observed the covenants of their leases; each lessee of these classes of machines to receive a share of the entire fund proportionate to the amounts paid by him for the use of such machines. Of the amount received from the use of Goodyear welters and stitchers in the United States, during the year ending December 31, 1910, not less than 15 per cent. will be invested in accordance with the foregoing plan, and of the amount so received from the use of the Goodyear turn sewing machines, not less than 10 per cent. will be so invested.

It is interesting to note the parallel between the inducement here provided, for the continuous and satisfactory maintenance of the relations of the manufacturer and user of the machinery and the bonuses some manufacturing corporations give employees who remain continuously and faithfully in the service of the company. The proposed plan seems to steer clear of the objections long urged to the system of rebates, which is still employed by some manufacturers as a means of securing the handling of their goods to the exclusion of all competitive products.

### Panama Lock Gates Bids Opened

The bids for the Panama Canal lock gates, covering the materials, plates and shapes, and the fabrication, were opened at Washington, D. C., June 15. Following were the bids submitted:

By the Maryland Steel Company, Sparrows Point, Md., for group A, \$3,620,736.93; for group B, \$4,788,632.38.

By the McClintic-Marshall Construction Company, Pittsburgh, Pa., for group A, \$2,298,876.70; for group B, \$3,075,598.12.

By the Riter-Conley Mfg. Company, Pittsburgh, Pa., for group A, \$4,322,152; for group B, \$5,861,105.

By the United States Steel Products Export Company, New York, for group A, \$2,690,308.02, alternative, \$2,616,670.15; for group B, \$3,578,079.48, alternative, \$3,486,370.92.

**A New Steel Record at Pueblo.**—All records of the open hearth department of the Colorado Fuel & Iron Company, at Pueblo, Colo., were broken in May, the total output for the month being 40,000 gross tons of rail steel. The superintendent of this department is R. W. Anderson, formerly of the Illinois Steel Company, South Works and of the Lackawanna Steel Company. The assistant superintendent is M. R. Schwer.

Plans for the shipment of a cargo of 2500 tons of Texas iron ore, from Texas City, Texas, in the steamer F. J. Luckenbach to Philadelphia, Pa., by E. J. Lavino & Co. have been deferred owing to labor difficulties. It was the intention of the shipper that this cargo should represent ores from different mines in eastern Texas, the idea being to have the same tried out at some of the eastern Pennsylvania furnaces. Under the circumstances but 600 tons will be brought by this vessel, although subsequent cargoes will be shipped. The furnace to which the present shipment will be sent for trial has not been decided upon.

### Work on Duluth Steel Plant to Proceed at Once

A committee of officials and engineers of the United States Steel Corporation visited Duluth, Minn., last week to study the situation as related to the proposed steel plant there and to decide as to the construction programme. The committee has made a report to the Finance Committee of the Steel Corporation and this has been approved. It is officially stated that it is the intention to proceed with the construction of the steel plant at Duluth with all reasonable dispatch.

Foundation and other work on the site has been in progress for several months. One of the most important pieces of construction preliminary to the building of the plant is the double deck steel bridge over the St. Louis River, connecting the Wisconsin bank of the river with the steel plant. Over this bridge ore will be brought to the plant, and by it connection will be secured through the Belt Line Railway with various railroads having terminals at Duluth and Superior. It will be recalled that the original plans called for two blast furnaces, an open hearth plant, rail mill, structural mill, merchant mill and auxiliary plant.

Stockholders of the Carborundum Company, whose works are situated at Niagara Falls, N. Y., met in the Pittsburgh offices of the company last week and voted to increase the capital stock from \$600,000 to \$2,000,000. The money secured, \$1,400,000, is for the purpose of covering expenditures for enlargements and improvements in plant and equipment, which were required by the growth of the business. The improvements have already been made, and there are at present no plans for further extensions, as the company has full capacity for its present business.

The Blair Engineering Company, Chicago and New York City, has installed the Blair water cooled ports in the open hearth furnace departments of the following plants: The Illinois Steel Company, American Steel Foundries, Maryland Steel Company, Lackawanna Steel Company, Grand Crossing Tack Works, Carnegie Steel Company (Duquesne plant), Portsmouth Steel Company and the Southern Steel & Iron Company.

The Board of Trade of Greenville, Pa., has made arrangements by which a concern operating plants at Jamestown, N. Y., and Peru, Ind.; manufacturing automobile parts, will remove to Greenville, Pa. The Board of Trade of Greenville has given this company a bonus of \$50,000, for which it receives 6 per cent. 10-year gold bonds free of tax, and which will be secured by first mortgage on the new plant.

The Youngstown Foundry & Machine Company, Youngstown, Ohio, has received a contract for a table for the new 26-in. skelp mill at the Brown-Bonnell Works of the Republic Iron & Steel Company, Youngstown, Ohio, and also a contract for a large shear for the Mingo Works of the Carnegie Steel Company at Youngstown, Ohio.

The American Gas Engine Company, Los Angeles, Cal., is erecting a building 50 x 125 ft., which it will use temporarily for manufacturing purposes. Later it will erect a building 50 x 200 ft., two stories, which it will equip with special high speed tools for the manufacture of engines.



## The New York Skyscrapers

### Interesting Facts Regarding the Era of Tall Buildings

BY THADDEUS S. DAYTON.

A 16-story steel framework building at the corner of Wall and Nassau streets, New York City, is being torn down to make way for one more than twice that high. It is the first of the skyscrapers to be demolished, and is the highest building that ever has been taken to pieces. Fifteen years ago it was one of the wonders of the construction of lower New York, an important point in the skyline of the city and the first big structure in what people were beginning to call the "cañon of Nassau street."

#### Skyscrapers Are No Longer a Curiosity

At the end of last year there were no less than 30 buildings of over 20 stories each on Manhattan Island alone. Thus far the two tallest are the Singer, that rises 41 stories, and, including its tower, the Metropolitan Building on Madison square, that goes up 50 stories. Many more high buildings have been planned since then, and some are already rising skyward. At the corner of Forty-second street and Broadway a 30-story building is going up. The new Municipal Building, near the entrance to the Brooklyn Bridge, will cover something like two full city blocks, and though it is to have but 24 stories it will tower in the air 560 ft., more than half as high again as the St. Paul, the American Surety or the Flatiron buildings.

The skyscraper era began 27 years ago, when the first steel skeleton building (the Home Insurance Company's) was erected in Chicago by W. L. B. Jenney, an architect of that city. This building differed somewhat in its principles of construction from the type that is in use to-day. The Chicago building was the first in which the system of "cage construction" was used. Cage construction means a framework of iron or steel columns and girders which carry the floors only and do not carry the outer walls. In skeleton construction the framework of iron or steel columns and girders carries not only the floors, but the outer walls also. The outer walls in cage construction had only their own weight to sustain and consequently might not have taken up much ground area if their use had been foreseen by the framers of the New York building law. Under this law the saving of ground area by the use of cage construction was comparatively small, with the result that the tallest building of this type did not exceed 13 stories. In New York, therefore, the era of skyscrapers virtually began with the Tower Building.

#### The Tower Building

This first steel framework building erected in New York still stands on lower Broadway. It is almost lost to-day among the giants that surround it, and it does not seem as though it ever could have been remarkable. In it, as well as the skyscrapers that have succeeded it, the weight of the curtain walls and floors is transmitted by girders to the wall columns at initial points and there cared for by the footings.

This Tower Building caused no end of heated discussion among architects and engineers when it was planned and while it was being put up. It was said that it could not be constructed; it was predicted that it would topple over; it was scouted as a commercial success. But it triumphantly proved all these forecasts false and by so doing inaugurated a new era of building construction and a new type of architecture that is essentially American. Here is a story that Bradford Lee Gilbert, the architect, tells of how he came to invent this building and how it received its name:

During the spring of 1887 a client in New York, who had purchased a double plot on New street—just south of

Exchange place—with a Broadway frontage (two-thirds the length) of only 21 ft. 6 in., with the understanding that the adjoining property on Broadway could be purchased later to square the plot, found this impossible and himself incumbered with a non-income property, difficult to dispose of except at a considerable loss.

In this dilemma my client appealed to me most urgently to find some possible solution of this problem which would allow him to retain and improve this property upon a paying basis. The building laws were explicit as to the required thickness of walls for superstructure, and anything higher than the existing buildings on the plot could only be erected at an actual loss, as it would not pay to erect a high building on the narrow Broadway plot to reach the larger rear building, when the thickness of walls required would leave a passageway only on the three main Broadway floors of a little over 10 ft. in width; while a low entrance building on Broadway for a higher office building on New street would only benefit abutting property. The problem grew perplexing and proportionately interesting.

Studying over the seeming impossibilities, Mr. Gilbert discovered two or three very interesting things. One of these was that the building law of New York did not limit the height of the foundations either below or above the curb line. Suddenly the idea occurred to him that it would be possible and thoroughly practicable to carry up the foundations seven or eight stories—or even to the roof itself—in this way obtaining floor space and additional width where it was most valuable, thus starting the superstructure eight stories above the curb, or practically omitting it altogether.

#### Skeleton Construction and the Building Law

Though strikingly new and revolutionary from an architectural and a construction point of view, there seemed nothing in the building law to conflict with this theory. With his plans carefully worked out, Mr. Gilbert went to Superintendent D'Oench, then of the Building Department, and discussed the matter in detail. Superintendent D'Oench agreed to the feasibility of the proposition, but stated frankly that, while it did not conflict with existing building laws, no law existed under which this construction could be approved. The plans therefore went to the Board of Examiners of the Building Department, with personal explanations, and were finally approved April 17, 1888. Of them in detail Mr. Gilbert said:

The construction throughout the narrow portion of the building, as filed and erected, called for 12 in. curtain or non-bearing inclosing walls between the foundation columns below the eighth story, and in some sections the entire height of the building, thirteen stories, or about 160 ft.; the weight of the curtain walls and floors being transmitted by girders to the wall columns at initial points, and there cared for by the cement and pile footings. Therefore, out of a total available width of 21 ft. 6 in., 20 ft. clear space was obtained (on account of an existing party wall on the south) through the most valuable and rentable of the Broadway floors and offices. In fact, this wall space, saved and rentable over the usual and previous construction, was estimated as worth upward of \$10,000 annually.

It is interesting to note that 10 years later, during 1898, in "A History of Real Estate Building and Architecture," written by William J. Fryer, who was a member of the Board of Examiners of the Building Department when the plans for the Tower Building were filed and approved, Mr. Gilbert was conceded to be the inventor of the skyscraper constructions. On the Tower Building to-day there still remains the bronze tablet, placed there 11 years ago, reading as follows:

This tablet, placed in 1899 by the Society of Architectural Iron Manufacturers of New York, commemorates the erection during 1888-9 in this the Tower Building, of the earliest example of the skeleton construction in which the entire weight of the walls and floors is borne and transmitted to the foundations by a framework of metallic posts and beams, originated and designed by Bradford Lee Gilbert, architect.

Mr. Gilbert and the owner had some idea of getting the new principle of skeleton construction patented, but possible infringements and lawsuits, it was thought, would outweigh the probable advantages. What the public and the architectural profession generally

thought of the new building Mr. Gilbert tells interestingly:

#### How Fears of Stability Were Overcome

After the plans were filed and the contract awarded, much interest being excited by the curious spectacle of a building 21½ ft. in width rising to a height of 160 ft. above its footings at 50 Broadway, many prophecies and comments were necessarily forthcoming. The owner, somewhat nervous, called one day with a letter from a prominent engineer who stated his belief that "the construction would prove dangerous if not disastrous during a heavy blow." I confessed it did look as if a great blank wall so high and narrow would blow over, but it was hardly to be supposed that, even if I were willing to assume the personal and professional risk, the Building Department would permit me to erect a menace to life and adjoining property.

"What would happen to me," the owner exclaimed, "if it should blow over? Think of the damages resulting! It would ruin me!"

"Well, how about me?" I replied. "Probably a noose would remove me from all further worry."

Taking out my drawings and strain sheets of the wind-bracing from footings to roof—practically a Howe truss on end—I continued:

"If you will kindly follow me, I will demonstrate to you by graphical analysis that the harder the wind blows the safer the building will be, as over 100 tons, under hurricane pressure, while the wind is blowing 70 miles an hour, is transmitted and cared for by the footings, and during the actual moment of inertia your building is safest."

He looked at me more confused than ever, and answered, "I cannot follow you and know nothing about strain sheets."

"I did not believe you did when I started," I replied, "but as you must trust somebody, unless you know of some good reason otherwise you had better trust your architect for your peace of mind's sake." Then I added, "To show my faith in the building and its construction, I will move my offices over and occupy the two upper floors on the Broadway end, and if the building falls I will fall with it."

That seemed to satisfy him. Just after this conference, one Sunday morning I awoke to find the wind blowing at a regular hurricane. As the building was in its most dangerous condition, the walls partly up and openings uncovered, affording the wind full sweep, I hurried downtown; and emerged from the elevated station on Broadway; there stood the building! The watchman helped me, and after climbing to the top we dropped a plumb line to the basement, and not even vibration was perceptible. I returned up Broadway singing the Doxology.

By a somewhat curious coincidence 1889, the year of the completion of the Tower Building, was also the year in which the first commercially successful electric elevator was designed. The elevator has been as important in the development of the modern skyscraper as skeleton construction. The two mechanical principles were first combined in the same structure a year or so later in the Waldorf-Astoria Hotel. The estimate is that to-day the elevators in the buildings of New York carry each 24 hours close to 7,000,000 passengers, or almost twice as many as the combined traction companies—surface, elevated and subway. Modern elevator service is said to be at its best to-day when on each trip, on the average, stops are made at four-tenths of the landings and each car carries four-tenths of its maximum load.

The Lackawanna Steel Company has decided to move its principal offices from New York City to its works at Lackawanna, near Buffalo, N. Y., as soon as the necessary additions to its present office building at Lackawanna can be completed. Selling offices necessary for local business will be maintained at the present location, 2 Rector street, New York City. Formal notice of the date of removal will be given as soon as definitely decided.

The National Mfg. Company, Pittsburgh, has recently secured orders from sheet and tin plate manufacturers for over 150 annealing boxes, most of them being equipped with the Johnson patent protecting strip, which prolongs the life of the box. The company states that where this special box is used the results are so good that repeat orders are invariably the result.

## Causes of the Increased Cost of Living

The Massachusetts Commission on the Cost of Living has completed its inquiry and prepared its report to the Legislature. The report will shortly be printed for distribution. From advance sheets the findings of the commission are taken as follows with regard to the causes of the recent advance of prices:

1. The primary cause of the world-wide advance of prices since 1897 is the increase of the gold supply, which has reduced the purchasing power of money and brought about a corresponding increase of values measured in money in all the leading commercial States, and at least in the United States has served as the basis for a vast extension of credit.

2. The advance of prices in the United States has been accelerated greatly by the economic waste of income, through uneconomic expenditure for war and national armament and through multiple forms of extravagance, both public and private, and of wastage, both individual and social. The increasing burden of disease, accident, crime and pauperism imposed upon society, and a loss through expenditure on a rising scale for luxuries and through wasteful methods of management in the household, are potent contributing factors to the advance of the cost of living.

3. The advance of prices has been further promoted by a complexity of causes, operating on the side of supply to reduce the volume and increase the expenses of production, and on the side of demand to extend and diversify the consumption of commodities. The main factors in restricting supply and enhancing the cost of commodities are the drain of population from the land, which has decreased the proportion of persons engaged in producing the food supply; the exhaustion of natural resources, which has resulted in increased expenses of production or diminished returns from the soil and uneconomic methods of production and distribution, especially the latter. The chief influences on the side of demand which have worked parallel to the forces affecting supply are the growing concentration of population in great cities, which has increased the proportion of nonproducing food consumers; the general advance of the standard of living, which has enlarged the requirements on the part of individual consumers of all classes; and the national habit of extravagance, which has further extended and diversified the demand for comforts and luxuries created by the advance in the standard of living.

4. With regard to the tariff, the trusts and the unions, which have been declared to be either primary or contributory causes of the high cost of living, the commission finds that none of these factors can be regarded as a direct and active cause of the recent increase of prices.

**The Garland Corporation's Industrial Town.**—The West Pittsburgh Realty Company, an identified interest of the Garland Corporation, Bailey-Farrell Building, Pittsburgh, Pa., has issued a pamphlet directing attention to the advantages of West Pittsburgh as a site for manufacturing plants. The town is situated on the east bank of the Beaver River, 40 miles from Pittsburgh, five miles from New Castle and 20 miles from Youngstown. Its railroads comprise the Pittsburgh & Lake Erie, Baltimore & Ohio, Pittsburgh & Western and Buffalo, Rochester & Pittsburgh. Manufacturing plants already there and controlled by the Garland Corporation include those of the Safety Armorite Conduit Company, Garland Nut & Rivet Company, Pressed Radiator Company of America, Sterling Conduit Company and Woodhouse, Bopp & Co. The last named firm manufactures silk. A large plot of ground has been set aside for home building purposes, and already a number of houses have been erected for the men employed in the several plants.



# The Iron and Metal Markets

## A Comparison of Prices

Advances Over the Previous Month in Heavy Type,  
Declines in Italics.

At date, one week, one month and one year previous.

	June 15, 1910.	June 8, 1910.	May 18, 1910.	June 16, 1909.
<b>PIG IRON, Per Gross Ton:</b>				
Foundry No. 2, standard, Philadelphia	\$16.75	\$16.75	\$17.00	\$16.50
Foundry No. 2, Southern, Cincinnati	15.00	15.00	14.75	14.50
Foundry No. 2, local, Chicago	16.75	16.75	17.00	16.50
Basic, delivered, eastern Pa.	16.25	16.25	16.50	15.50
Basic, Valley furnace	14.75	14.75	15.00	14.75
Bessemer, Pittsburgh	16.65	16.65	17.40	16.15
Gray forge, Pittsburgh	15.15	15.40	15.90	14.90
Lake Superior charcoal, Chicago	18.50	18.50	18.50	19.50

<b>BILLETS, &amp;c., Per Gross Ton:</b>				
Bessemer billets, Pittsburgh	\$5.50	25.50	26.00	23.00
Forging billets, Pittsburgh	31.00	31.00	32.00	25.00
Open hearth billets, Philadelphia	28.50	29.00	29.00	25.00
Wire rods, Pittsburgh	31.00	31.00	32.00	29.00
Steel rails, heavy, at mill	28.00	28.00	28.00	28.00

<b>OLD MATERIALS, Per Gross Ton:</b>				
Steel rails, melting, Chicago	14.00	15.00	15.00	15.00
Steel rails, melting, Philadelphia	14.50	14.50	14.50	16.00
Iron rails, Chicago	17.00	17.00	17.50	17.00
Iron rails, Philadelphia	20.00	20.00	20.00	19.50
Car wheels, Chicago	15.50	15.50	15.50	16.00
Car wheels, Philadelphia	15.00	15.00	15.00	15.00
Heavy steel scrap, Pittsburgh	15.25	15.25	15.00	15.75
Heavy steel scrap, Chicago	13.00	13.50	13.50	14.50
Heavy steel scrap, Philadelphia	14.50	14.50	14.50	16.00

<b>FINISHED IRON AND STEEL.</b>				
Per Pound:	Cents.	Cents.	Cents.	Cents.
Refined iron bars, Philadelphia	1.47½	1.50	1.50	1.45
Common iron bars, Chicago	1.47½	1.47½	1.50	1.35
Common iron bars, Pittsburgh	1.50	1.55	1.55	1.40
Steel bars, tidewater, New York	1.61	1.61	1.61	1.36
Steel bars, Pittsburgh	1.45	1.45	1.45	1.20
Tank plates, tidewater, New York	1.66	1.66	1.66	1.41
Tank plates, Pittsburgh	1.50	1.50	1.50	1.25
Beams, tidewater, New York	1.66	1.66	1.66	1.41
Beams, Pittsburgh	1.50	1.50	1.50	1.25
Angles, tidewater, New York	1.66	1.66	1.66	1.41
Angles, Pittsburgh	1.50	1.50	1.50	1.25
Skelp, grooved steel, Pittsburgh	1.50	1.50	1.50	1.30
Skelp, sheared steel, Pittsburgh	1.60	1.60	1.60	1.40

<b>SHEETS, NAILS AND WIRE.</b>				
Per Pound:	Cents.	Cents.	Cents.	Cents.
Sheets, black, No. 28, Pittsburgh	2.40	2.40	2.40	2.20
Wire nails, Pittsburgh	1.80	1.80	1.80	1.70
Cut nails, Pittsburgh	1.75	1.75	1.80	1.65
Barb wire, galv., Pittsburgh	2.10	2.10	2.10	2.00

<b>METALS, Per Pound:</b>	Cents.	Cents.	Cents.	Cents.
Lake copper, New York	12.87½	13.00	13.00	13.62½
Electrolytic copper, New York	12.50	12.75	12.75	13.37½
Spelter, New York	5.15	5.15	5.30	5.50
Spelter, St. Louis	5.00	5.00	5.15	5.35
Lead, New York	4.37½	4.37½	4.35	4.35
Lead, St. Louis	4.20	4.22½	4.20	4.25
Tin, New York	33.60	32.85	33.20	29.50
Antimony, Hallett, New York	8.12½	8.12½	8.12½	7.50
Nickel, New York	45.00	45.00	45.00	45.00
Tin plate, 100 lb., New York	\$3.84	\$3.84	\$3.84	\$3.64

\* These prices are for largest lots to jobbers.

## Prices of Finished Iron and Steel f.o.b. Pittsburgh

Freight rates from Pittsburgh in carloads, per 100 lb.: New York, 16c.; Philadelphia, 15c.; Boston, 18c.; Buffalo, 11c.; Cleveland, 10c.; Cincinnati, 15c.; Indianapolis, 17c.; Chicago, 18c.; St. Paul, 32c.; St. Louis, 22½c.; New Orleans, 30c.; Birmingham, Ala., 45c. Rates to the Pacific Coast are 80c. on plates, structural shapes and sheets, No. 11 and heavier; 85c. on sheets, Nos. 12 to 16; 95c. on sheets, No. 16 and lighter; 65c. on wrought pipe and boiler tubes.

**Structural Shapes.**—I-beams and channels, 3 to 15 in., inclusive, 1.50c. to 1.55c., net; I-beams over 15 in., 1.65c., net; H-beams over 8 in., 1.75c.; angles, 3 to 6 in., inclusive, ¼ in. and up, 1.60c., net; angles over 6 in., 1.65c., net; angles, 3 x 3 in. and up, less than ¼ in., 1.75c., base, half extra, steel bar card; tees, 3 in. and up, 1.65c., net; tees, 3 in. and up, 1.60c., net; angles, channels and tees, under 3

in., 1.50c., base, plus 10c., half extra, steel bar card; deck beams and bulb angles, 1.80c., net; hand rail tees, 2.80c., net; checkered and corrugated plates, 2.80c., net.

**Plates.**—Tank plates, ¼ in. thick, 6¼ in. up to 100 in. wide, 1.50c. to 1.55c., base. Following are stipulations prescribed by manufacturers, with extras to be added to base price (per pound) of plates:

Rectangular plates, tank steel or conforming to manufacturers' standard specifications for structural steel dated February 6, 1903, or equivalent, ¼ in. thick and over on thinnest edge, 100 in. wide and under, down to but not including 6 in. wide, are base.

Plates up to 72 in. wide, inclusive, ordered 10.2 lb. per square foot are considered ¼ in. plates. Plates over 72 in. wide must be ordered ¼ in. thick on edge, or not less than 11 lb. per square foot, to take base price. Plates over 72 in. wide ordered less than 11 lb. per square foot down to the weight of 3-16 in. take the price of 3-16 in.

Allowable overweight, whether plates are ordered to gauge or weight, to be governed by the standard specifications of the Association of American Steel Manufacturers.

Gauges under ¼ in. to and including 3-16 in. on thinnest edge	\$0.10
Gauges under 3-16 in. to and including No. 8	.15
Gauges under No. 8 to and including No. 9	.25
Gauges under No. 9 to and including No. 10	.30
Gauges under No. 10 to and including No. 12	.40
Sketches (including all straight taper plates), 3 ft. and over in length	.10
Complete circles, 3 ft. diameter and over	.20
Boiler and flange steel	.10
"A. B. M. A." and ordinary firebox steel	.20
Still bottom steel	.30
Marine steel	.40
Locomotive firebox steel	.50
Widths over 100 in. up to 110 in., inclusive	.05
Widths over 110 in. up to 115 in., inclusive	.10
Widths over 115 in. up to 120 in., inclusive	.15
Widths over 120 in. up to 125 in., inclusive	.25
Widths over 125 in. up to 130 in., inclusive	.50
Widths over 130 in.	1.00
Cutting to lengths or diameters under 3 ft. to 2 ft., inclusive	.25
Cutting to lengths or diameters under 2 ft. to 1 ft., inclusive	.50
Cutting to lengths or diameters under 1 ft.	1.55
No charge for cutting rectangular plates to lengths 3 ft. and over.	

TERMS.—Net cash 30 days.

**Sheets.**—Minimum prices for mill shipments on sheets in carload and larger lots, on which jobbers charge the usual advances for small lots from store, are as follows: Black annealed sheets, Nos. 3 to 8, 1.70c.; No. 9 and 10, 1.75c.; Nos. 11 and 12, 1.80c.; Nos. 13 and 14, 1.85c.; Nos. 15 and 16, 1.95c. Box annealed sheets, Nos. 17 and 21, 2.20c.; Nos. 22 to 24, 2.25c.; Nos. 25 and 26, 2.30c.; No. 27, 2.35c.; No. 28, 2.40c.; No. 29, 2.45c.; No. 30, 2.55c. Galvanized sheets, Nos. 13 and 14, 2.50c.; Nos. 15 and 16, 2.60c.; Nos. 17 to 21, 2.75c.; Nos. 22 to 24, 2.90c.; Nos. 25 and 26, 3.10c.; No. 27, 3.30c.; No. 28, 3.50c.; No. 29, 3.60c.; No. 30, 3.85c. Painted roofing sheets, No. 28, \$1.70 per square. Galvanized roofing sheets, No. 28, \$3 per square, for 2½-in. corrugations.

**Wrought Pipe.**—The following are the discounts on the Pittsburgh basing card on carloads of wrought pipe now in effect:

	Steel	Galv.	Iron
¾ and 1 in.	70	54	60
1 in.	71	57	67
1 ¼ in.	74	62	70
1 ½ in.	78	68	74
2 to 12 in.	72	57	68
Plugged and Reamed.			
1 to 4 in.	76	60	72
Extra Strong, Plain Ends.			
¾ to 1 in.	63	51	50
1 to 1 ¼ in.	70	58	66
1 ½ to 2 in.	66	54	62
2 to 3 in.	54	42	..
Double Extra Strong, Plain Ends.			
¾ to 1 in.	59	49	55
1 to 1 ¼ in.	..	..	44

The above steel pipe discounts are for "card weight," subject to the usual variation of 5 per cent.

**Boiler Tubes.**—Discounts on lap welded steel and charcoal iron boiler tubes to jobbers in carloads are as follows:

	Steel	Iron
1 to 1 ¼ in.	49	43
1 ½ to 2 ¼ in.	61	43
2 ½ in.	63	48
2 ¾ to 3 in.	69	55
3 to 13 in.	61	43
2 ½ in. and smaller, over 18 ft., 10 per cent. net extra.		
2 ½ in. and larger, over 22 ft., 10 per cent. net extra.		

Less than carloads to destinations east of the Mississippi River will be sold at delivered discount for carloads lowered by two points, for lengths 22 ft. and under; longer lengths, f.o.b. Pittsburgh.

**Wire Rods.**—Bessemer, open hearth and chain rods, \$31.

**Steel Rivets.**—Structural rivets, ¼ in. and larger, 2.15c., base; cone head boiler rivets, ¼ in. and larger, 2.25c., base; ½ in. and 11-16 in. take an advance of 15c., and ¾ in. and 9-16 in. take an advance of 50c.; in lengths shorter than 1-in. also take an advance of 50c. Terms are 30 days, net cash, f.o.b. mill. The above prices are absolutely minimum on contracts for large lots, makers charging the usual advances of \$2 to \$3 a ton to the small trade.

# THE IRON AND METAL MARKETS

## Pittsburgh

PARK BUILDING, June 15, 1910.—(By Telegraph.)

**Pig Iron.**—Inquiries for pig iron for last half of the year delivery are heavy. In addition to the 15,000 tons or more of No. 2 foundry and forge bought by the Westinghouse Air Brake Company for last half, it is expected that the Colonial Steel Company will close this week for a very large tonnage of Bessemer and basic iron for delivery over the year beginning July 1. Present prices on pig iron are regarded as extremely low, and a general buying movement would no doubt bring about a higher market. We quote Bessemer iron at \$15.75 to \$16; malleable Bessemer, \$15 to \$15.25; basic, \$14.75 to \$15; No. 2 foundry, \$14.75 to \$15, and gray forge, \$14.50, all at Valley furnace, with a freight rate of 90c. a ton for delivery in the Pittsburgh district.

**Steel.**—The market on Bessemer soft steel continues weak, and reports are insistent that Bessemer 4 x 4 in. soft billets have sold on the basis of about \$25, maker's mill. The market on open hearth steel is firm, but inquiries are not so active. We quote Bessemer billets at \$25.50 to \$26, and sheet bars, \$26.50 to \$27; 4 x 4 in. open hearth billets, \$28 to \$28.50; open hearth, small billets, \$29 to \$29.50; open hearth sheet and tin bars, \$28.50 to \$29, and forging billets, \$31 to \$32, all f.o.b. Pittsburgh, freight to destination added.

(By Mail.)

There have been some further heavy purchases of pig iron in the past week, but at prices somewhat lower than was generally believed would be reached. The Westinghouse Air Brake Company, which came in the market about two weeks ago, presumably for 1000 tons of No. 2 foundry and the same quantity of forge, bought upward of 15,000 tons of No. 2 foundry and forge, the No. 2 foundry for prompt shipment going at about \$14.35, and for last quarter at \$14.50, and slightly higher, at furnace. The forge iron is reported to have gone at about \$14.25, at Valley furnace, the lowest price reached on this grade of iron for more than a year. The Shenango Valley steel casting interest, referred to last week, has bought about 15,000 tons of Bessemer and basic iron for last half delivery, on a sliding scale basis. It is understood the Colonial Steel Company is in the market for upward of 15,000 tons, and possibly 20,000 tons, of basic pig iron, deliveries running over the year beginning July 1. Bids on this iron have been going in for nearly two weeks and will probably close June 15. It is said some very low prices have been named, and a good deal of pressure is evident on the part of some furnaces to sell iron. The market on soft Bessemer steel continues weak, but reports are denied that 4 x 4 in. Bessemer billets have sold on the basis of \$25, maker's mill, Wheeling. The local market on Bessemer billets is regarded as being about \$25.50 to \$26 and on 4 x 4 in. open hearth billets \$28 to \$28.50, maker's mill. There has been decidedly better demand for structural material, plates, wire products and the larger sizes of steel pipe. On the other hand, sheets show a falling off in new orders, and the buying season in tin plate is over, but the mills are well filled up for the balance of this year. The feeling in the general trade is decidedly more optimistic, and prices on all kinds of finished material, except sheets, are firmer. The scrap and coke markets continue rather dull, with prices fairly steady.

**Ferromanganese.**—Weakness in prices is bringing out a good deal of inquiry for ferro, and reports are that a leading consumer has bought 500 to 600 tons a month running over all of 1911 on the basis of about \$40, Baltimore. This is a remarkably low price for 80 per cent. ferro when the deliveries which run so far ahead are considered. Prompt 80 per cent. ferro is quoted at about \$39.50 to \$39.75, Baltimore, the freight rate to Pittsburgh being \$1.95 a ton.

**Ferrosilicon.**—There is some inquiry but mostly in small lots for prompt shipment, the larger consumers having covered their requirements ahead some time ago. Prices are lower than they have been in several years, and we quote 50 per cent. ferrosilicon at \$58, delivered Pittsburgh. We quote 10 per cent. at \$23; 11 per cent., \$24, and 12 per cent., \$25, all at Ashland furnace, to which \$1.90 a ton should be added for delivery in the Pittsburgh district.

**Rods.**—The increase in new demand for wire and wire products is reflected in wire rods, for which there is more inquiry than for some time past, and several sales of good sized lots have been made recently in this district. One sale of 1200 to 1500 tons of open hearth rods for third quarter delivery is reported on the basis of about \$32 for No. 5. We

quote Bessemer rods at \$31, and open hearth and chain rods at \$32, Pittsburgh. Possibly on a large inquiry for delivery over last half these prices might be slightly shaded.

**Skelp.**—Several large contracts for sheared iron and steel plates have recently been placed with local mills by pipe concerns that have taken large orders for oil and gas lines for delivery in the West. It is estimated that these contracts for sheared plates amount to 15,000 to 20,000 tons, one local mill having already booked about 12,000 tons, and an Eastern mill 8000 to 10,000 tons. For ordinary widths and gauges we quote grooved steel skelp at 1.50c. to 1.55c.; sheared steel skelp, 1.60c. to 1.65c.; grooved iron skelp, 1.80c., and sheared iron skelp, 1.90c., all f.o.b. mill, Pittsburgh.

**Steel Rails.**—Last week the Carnegie Steel Company had a good week in light rails, having booked about 3200 tons, and received specifications against contracts for about 1000 tons. New demand for light rails has been active for some time, and the Carnegie Steel Company is operating one of its Edgar Thomson mills to full capacity on light sections. As yet only small orders are being placed in standard sections, these running from 200 to 300 tons, while occasionally an order as large as 1000 tons is placed. We quote steel axles at 1.75c. to 1.80c., and splice bars, 1.50c., at mill, Pittsburgh. Light rail prices are as follows: 8 to 10 lb., \$32; 12 to 14 lb., \$29; 16, 20 and 25 lb., \$28; 30 and 35 lb., \$27.75, and 40 to 45 lb., \$27, Pittsburgh. These prices are for 250-ton lots and over, and for small lots premiums of 50c. per ton and more are being paid. We quote standard sections at \$28, at mill.

**Structural Material.**—The American Bridge Company has been awarded the contract for the Kentucky & Indiana Railroad bridge at Louisville, about 15,000 tons, also a hot metal bridge for the Republic Iron & Steel Company at Youngstown, 600 to 650 tons, and the Riter-Conley Mfg. Company has taken 1400 tons for the South Side plant of A. M. Byers & Co. Bids have been asked on the substructure for a bridge across the Allegheny River at what is known as the Point, requiring about 300 tons, but bids for the superstructure will probably not be asked for for six months. Bids have also been readvertised on the county bridge at Oil City, Pa., taking 1600 tons. There is talk of the Baltimore & Ohio and the Pittsburgh & Lake Erie Railroads jointly building a bridge across the Monongahela River at Glassport, Pa., but no bids have yet been asked. Inquiries for new work in the structural trade are very active. One local concern is pretty well filled up for several months ahead, and is bidding only on attractive work. Prices continue firm, and structural concerns advise us that 1.50c., Pittsburgh, on beams and channels up to 15-in. is being absolutely held.

**Plates.**—Contracts for about 30,000 to 40,000 tons of plates have been placed with one Pittsburgh mill, and also an Eastern mill, these plates to be used in building oil and gas lines in the West. New car orders in the past week have been light, the total orders so far placed by the Baltimore & Ohio Railroad amounting to 2500 cars. Bids will go in on June 15 for 57,000 tons of plates and shapes for the Panama lock gates. It is said 7,000,000 rivets will be driven in this work. Local plate mills are well filled up for three or four months ahead and are holding plates firmly at 1.50c., but some of the smaller plate mills that do not roll lighter than about 64 in. are naming 1.45c. We continue to quote ¼-in. and heavier plates at 1.50c., Pittsburgh.

**Sheets.**—Mills are catching up some on back deliveries of blue annealed, electric and deep stamping sheets and premiums formerly paid for prompt delivery on these grades of sheets have about disappeared. Demand for black and galvanized sheets in the lighter gauges has shown some falling off, and concessions of \$2 to \$3 a ton over regular prices are still being made by a few mills, but only on orders for prompt shipment. Regular prices on black, galvanized and roofing sheets, which are sometimes shaded \$2 to \$3 a ton, will be found on a previous page.

**Tin Plate.**—June will, no doubt, be a record breaker in output of tin plate. The American Sheet & Tin Plate Company is now making more tin plate than ever before in its history, and there has recently been added to tin plate capacity 12 hot mills of the Jones & Laughlin Steel Company at Aliquippa, 10 hot mills of the Phillips Sheet & Tin Plate Company at Weirton, W. Va.; also 10 hot mills of the McKeesport Tin Plate Company, while the Union Sheet & Tin Plate Company, which has been operating four hot mills on black plate at Marietta, Ohio, announced that it has added a new tin house, equipped with modern tinning pots, and is now able to make prompt shipment on both bright and roofing plates. New demand for tin plate is not very heavy, but consumers are urgent for deliveries on their contracts, on which the mills are considerably behind in shipment. Prices remain very firm, and we continue to quote 100-lb. cokes at \$3.60 per base box, f.o.b. Pittsburgh.

**Bars.**—New demand for iron bars is quiet, as railroads and wagon builders show no disposition at present to place



## THE IRON AND METAL MARKETS

contracts for their requirements over the balance of this year. The bar iron mills would take care of much more tonnage if they had it. New orders being placed for steel bars are fairly heavy, much of the new business being for concrete work, and implement makers and wagon builders are specifying very freely against the contracts they recently placed for delivery over balance of this year. All the leading steel bar mills are from four to six weeks or longer behind in deliveries. We quote steel bars at 1.45c. and common iron bars at 1.50c. to 1.55c., Pittsburgh.

**Hoops and Bands.**—New orders being placed are moderate in volume, but consumers are specifying liberally on their contracts. Several makers are naming slightly lower prices on hoops and bands rolled from soft Bessemer steel billets owing to the recent decline in prices of soft steel. We quote steel hoops for forward delivery at 1.50c. to 1.60c., while for prompt shipment as high as 1.65c. is obtainable. Steel bands are 1.40c. to 1.50c. on contracts for forward delivery and 1.60c. to 1.65c. for reasonable prompt shipment, these carrying steel bar card extras.

**Spelter.**—The market is very dull, there being little new demand, and prices show steady decline over practically all of last week. We quote prime grades of Western spelter at 5c., East St. Louis, or 5.12½c., Pittsburgh. On a firm offer this price might be shaded.

**Spikes.**—No large inquiries from the railroads have come in the market for some time, new demand for railroad spikes still being mostly in small lots and for repair work. In small railroad and boat spikes new demand is quite active and makers are busy on these grades, with considerable work ahead. We quote standard sizes of railroad spikes, 4½ x 9-16 in. and larger, at \$1.60 to \$1.65 for Western shipment and \$1.65 to \$1.70 for local trade. Boat and small railroad spikes are firm, at \$1.75, base, these prices being for carload and larger lots.

**Rivets.**—New demand for rivets is mostly in small lots for nearby requirements, and specifications against old orders are coming in only fairly well. Some of the smaller makers are shading regular prices, which are 2.15c. for structural rivets and 2.25c. for boiler rivets, f.o.b. Pittsburgh.

**Shafting.**—We note a continued active demand for shafting; consumers are still placing new orders very freely, while specifications against contracts are heavy. It is stated that the regular discounts on shafting of 55 per cent. off in carload and larger lots and 50 per cent. in small lots, delivered in base territory, are being firmly held.

**Wire Products.**—New demand for wire nails continues to show a steady increase, small dealers placing more liberal orders, while the jobbers are buying in larger quantities and with more frequency, indicating that the heavy stocks which they have carried for so long are moving out more freely. New demand for barb and plain wire is also reported heavy, but cut nails are moving out rather slowly. We quote wire nails at \$1.80 in carload and larger lots; galvanized barb wire, \$2.10; painted, \$1.80; annealed fence wire, \$1.60; galvanized, \$1.90; cut nails, \$1.75 to \$1.80, all f.o.b. cars, Pittsburgh, with usual terms, and freight to destination added.

**Merchant Pipe.**—It is stated that a local interest has taken the contract for 100 miles of 6-in. line pipe for the Gulf Refining Company, to be used in laying an oil line in the South. Several very large inquiries for oil and gas lines are in the market, and on the large sizes of pipe a leading mill is pretty well filled up for the balance of this year. In the butt weld sizes of merchant pipe new demand is dull and the mills have very little business on their books. It is stated that regular discounts on both iron and steel pipe, printed on another page, are being firmly held.

**Boiler Tubes.**—A local mill, it is stated, has taken the tubes for a large number of locomotives to be built by the Baltimore & Ohio and New York Central railroads. New demand for locomotive tubes has been very heavy for some time, but for merchant tubes is only fairly active. Regular discounts on locomotive and merchant tubes, printed on a previous page, are fairly well maintained, but are sometimes slightly shaded.

**Coke.**—The market on furnace coke does not show much betterment, either in the direction of new demand or in prices. Some makers are asking slightly higher figures on furnace coke for balance of this year shipment, but a Valley furnace interest is reported to have recently closed for 6000 tons a month of standard grade furnace coke for balance of the year delivery on the basis of about \$1.80 or slightly less in net tons at oven. Output of coke in the Upper and Lower Connellsville regions is running at about 390,000 tons per week, and it is evident that further restriction in output of coke will have to be made before there will be much betterment in prices.

**Iron and Steel Scrap.**—On June 30 a number of plants that are pretty heavy consumers of scrap of all kinds will close down for inventory and repairs, and these concerns

are now practically out of the market as buyers of scrap until they are about ready to start up again. The consuming interest located at Monessen and Sharon, Pa., and also at Brackenridge, has been taking in scrap at a fairly heavy rate for some time, the Brackenridge interest having been a heavy buyer of borings and turnings, of which it has secured a very large tonnage at relatively low prices. The market is fairly strong, but it is believed the scrap trade will be more or less quiet during the balance of this month and in the greater part of July, owing to so many mills being closed down. Dealers quote about as follows, per gross ton, for delivery at Pittsburgh or elsewhere as noted:

Heavy steel scrap, Steubenville, Pol-	
lansbee, Sharon, Monessen and Pitts-	
burgh delivery.....	\$15.25 to \$15.50
No. 1 foundry cast.....	14.25 to 14.50
No. 2 foundry cast.....	13.25 to 13.50
Bundled sheet scrap, at point of ship-	
ment.....	10.50 to 10.75
Reroiling rails, Newark and Cambridge,	
Ohio, and Cumberland, Md.....	16.00 to 16.25
No. 1 railroad malleable scrap.....	14.25 to 14.50
Grate bars.....	11.00 to 11.25
Low phosphorus melting stock.....	18.50 to 19.00
Iron car axles.....	25.00 to 25.25
Steel car axles.....	21.00 to 21.25
Locomotive axles.....	26.00 to 26.25
No. 1 busheling scrap.....	13.50 to 13.75
No. 2 busheling scrap.....	9.00 to 9.25
Old car wheels.....	14.00 to 14.25
Sheet bar crop ends.....	17.00 to 17.25
Cast iron borings.....	8.00 to 8.25
Machine shop turnings.....	9.75 to 10.00

### Chicago

FISHER BUILDING, June 15, 1910.—(By Telegraph.)

The season has advanced far enough to afford definite information regarding crops. An official of the International Harvester Company has given out a statement based upon the unusual resources of that company which makes a very favorable showing. In a few States the condition of winter wheat is disappointing, but, taking the country as a whole, there has been an increase; the acreage and the prospects are for a full average crop or better. Conditions are unusually favorable for oats. There will be an important crop in the Mississippi Valley, and the hay crop is heavy. The season was backward for corn, but the weather has been favorable for this crop the past 10 days. The barley crop is disappointing, but it represents a small part of total agricultural production. In the iron and steel market, the only branch in which there is notable activity is the new structural business. During the week following the late political disturbance at Washington regarding freight rates there was a renewal of hesitation among capitalists who erect steel buildings. Last week, however, these investors, who are identified with banking and financial circles, have shown more confidence, and a good run of steel building contracts was booked throughout the West, with other important business about to be closed. In railroad circles a pessimistic feeling continues among higher officials, who are disappointed at their inability to advance freight rates. The feeling has not, however, interfered with current business in track supplies and material and important orders for equipment are under consideration. The depressing effect is felt chiefly in bar iron and among malleable foundries and manufacturers of miscellaneous equipment. There is a good run of new business in steel bars, but there is keen competition among the sheet interests on any business running into round lots. There is a good demand for barb wire, but the trade is entering the dull season on other common wire products. There has been good local buying of copper by consumers taking advantage of the decline in price. In old material all grades of steel scrap are seeking a lower level, both in material for open hearth furnaces and steel foundries, and the weakness in heavy malleable scrap indicates a lack of new business among malleable foundries which work on railroad contracts. There is a general feeling in the trade, however, that conditions are better, and it is believed that good crops will force activity in railroad buying, which will eventually cover the weak spots in the market.

**Pig Iron.**—A deadlock continues in this market between buyers and the furnace interests regarding the price of Southern foundry grades. During the past two weeks there have been inquiries from good buyers aggregating altogether 20,000 to 30,000 tons of Southern foundry iron, many of these inquiries taking the form of firm offers. Each of the leading Southern furnace interests have had the opportunity to take 10,000 to 20,000 tons of this business on firm offers at \$11.50 for last half, but each in turn seems to have resisted the temptation, and the market for last half remains firm at \$12. There is good iron for June shipment and third quarter at \$11.50, but not much business is done on this basis. It is believed that buyers are generally covered through the third quarter in Chicago territory, and their interest is confined chiefly to the last quarter or last half, with a few inquiries for first quarter of 1911. So far as can be traced in this

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market the business for last half that has been done at \$11.50 has been on analysis iron varying slightly from No. 2 or on high phosphorus Tennessee iron. A plow manufacturer at Moline, Ill., is reported to have bought 2000 tons of analysis iron for last half. There is an inquiry from a Milwaukee manufacturing interest for about 5000 tons of Southern foundry. A local sanitary manufacturer has inquired for 2000 or 3000 tons for delivery at Beloit, Wis., and a school furniture foundry has inquired for 1000 tons. A local malleable works has inquired for 1500 tons of Southern and an electric company for 500 tons of Southern. A wagon manufacturer at South Bend, Ind., has asked for prices on 500 tons of Southern and a thresher company at Battle Creek, Mich., has inquired for 2500 tons, about one-fourth Southern and the remainder Northern. A manufacturing interest with plants outside of Chicago inquired last week for 1000 tons each of Northern and Southern. In the Northern market no local business of any moment is reported. A sale of malleable Bessemer, 2000 tons, has been made from Cleveland for delivery at Indianapolis, but west of Chicago buyers seem disposed to limit their purchases to small lots running up to 500 tons. In many cases foundries which bought heavily last winter at higher prices are reserving this iron and buying small lots at the present market for early delivery which they can use in figuring cost on current production. The local furnaces have sold a considerable tonnage in the past spring for early delivery, usually in small lots, but do not seem anxious to make sales for extended deliveries. The Federal Furnace Company will blow out one stack this week for repairs. The following quotations are for June shipment, Chicago delivery:

Lake Superior charcoal.....	\$18.50 to \$19.00
Northern coke foundry, No. 1.....	17.25 to 17.75
Northern coke foundry, No. 2.....	16.75 to 17.25
Northern coke foundry, No. 3.....	16.25 to 16.75
Northern Scotch, No. 1.....	17.75 to 18.25
Southern coke, No. 1.....	16.35 to 16.85
Southern coke, No. 2.....	15.85 to 16.35
Southern coke, No. 3.....	15.60 to 16.10
Southern coke, No. 4.....	15.35 to 15.85
Southern coke, No. 1 soft.....	16.35 to 16.85
Southern coke, No. 2 soft.....	15.85 to 16.35
Southern gray forge.....	15.10 to 15.60
Southern mottled.....	14.85 to 15.35
Malleable Bessemer.....	16.75 to 17.25
Standard Bessemer.....	18.40 to 18.90
Jackson Co. and Kentucky silvery, 6%.....	19.40 to 19.90
Jackson Co. and Kentucky silvery, 8%.....	20.40 to 20.90
Jackson Co. and Kentucky silvery, 10%.....	21.40 to 21.90

(By Mail)

**Billets.**—There are few inquiries in this market, and Pittsburgh prices govern the occasional transactions that are noted.

**Rails and Track Supplies.**—There is a good run of small inquiries from minor Western railroads, and the Eastern mills that are represented in this market are booking many of these orders. Chicago mills report good specifications for track supplies, and politics has not affected this branch of railroad purchasing. We quote standard railroad spikes at 1.80c. to 1.90c., base; track bolts with square nuts, 2.50c. to 2.60c., base, all in carloads, Chicago. Light rails, 40 to 45 lb., \$27; 30 to 35 lb., \$27.75; 16, 20 and 25 lb., \$28; 12 lb., \$29, Chicago.

**Structural Material.**—A good lot of structural contracts was closed in the West the past week, and the storm in the railroad financial world seems to have passed entirely away in this branch of the market. It is expected that the current week will also bring out a good tonnage of new business, as several important projects are on the point of being closed. The American Bridge Company booked a contract last week from the Atchison, Topeka & Santa Fe for 1200 tons of miscellaneous bridges; from the Chicago & Northwestern, 1350 tons, for new shops at Fortieth street, in Chicago; from the Elgin, Joliet & Eastern, 200 tons of bridge work, and from a steel car company 1400 tons of axles. The Morava Construction Company booked 3000 tons for new factory buildings for the International Harvester Company at Milwaukee and 1000 tons for the new Wells Fargo & Co. Building in Chicago. Milliken Brothers took the contract for 1500 tons for the Olympic Club at San Francisco. The Pacific Rolling Mill Company took the Lachman Building at San Francisco, amounting to 700 tons. A 500-ton contract for new shop buildings of the Oliver Chilled Plow Works at South Bend, Ind., went to the Indiana Bridge Company at Muncie, Ind. A new foundry building for Crane Company, Chicago, 300 tons, was let to the South Halsted Street Iron Works, Chicago. The North Works of the Illinois Steel Company will erect 300 tons for the Rock Island Plow Company, Rock Island, Ill., on which immediate construction was desired, the material being taken from store. A building for the Canton Electric Company, Canton, Ohio, 200 tons, went to the Pittsburgh Bridge & Iron Works. The Minneapolis Steel & Machinery Company has the contract for a balloon flue, 100 tons, for a Utah plant of the United States Smelting Company. The market on plain material from mill is weak. While small

orders are taken at 1.50c., Pittsburgh, concessions are reported on any desirable business. We quote plain material from mill, 1.68c. to 1.73c., Chicago; from store, 1.90c. to 2c., Chicago.

**Plates.**—The mills are beginning to receive specifications on the car orders that were placed during May by the railroads. Concessions are reported on plates, but cannot be verified in this market, and 1.50c. is believed to be the minimum for ordinary business, with some small lots being taken at 1.55c. We quote mill prices at 1.68c. to 1.73c., Chicago; store prices, 1.90c. to 2c., Chicago.

**Sheets.**—An order of any size seems to invite strong competition among Eastern mills and concessions are reported from scheduled prices. There is a fair amount of new business, but buyers show no inclination to cover their requirements for six months, as they did last fall. We quote as follows, Chicago: No. 10 annealed, 1.93c.; No. 28 black, 2.58c.; No. 28 galvanized, 3.68c. Prices from store, Chicago, are: No. 10 blue annealed, 2.25c. to 2.35c.; No. 28 black, 3c. to 3.10c.; No. 28 galvanized, 4c. to 4.10c.

**Bars.**—There is a good volume of new business in both soft and hard steel bars, and specifications are coming in on a very satisfactory basis on current contracts. On yearly contracts the buyers are generally specifying larger quantities on their odd sizes and sections to guard against the delays in deliveries which occurred last winter. There are good inquiries for concrete bars. The bar iron market is quiet, as the railroads have been restricting their purchases to the minimum until after the end of their fiscal year, June 30. They are also very backward in placing contracts for their requirements for the last half. Subject to the usual delay in delivery of soft steel bars, we quote as follows: Soft steel bars, 1.63c. to 1.68c.; bar iron, 1.47½c. to 1.52½c.; hard steel bars rolled from old rails, 1.50c. to 1.60c., all Chicago.

**Rods and Wire.**—The current demand for barb wire is larger than the trade expected. Manufacturing consumers of wire are specifying liberally for their requirements. Jobbers' carload prices, which are quoted to manufacturing buyers, are as follows: Plain wire, No. 9 and coarser, base, 1.83c.; wire nails, 2.03c.; painted barb wire, 2.03c.; galvanized, 2.33c., all Chicago.

**Merchant Steel.**—There is a good normal volume of business on all lines of merchant steel, especially in purchases from store. The automobile manufacturers are not so strenuous as they were some time ago in their efforts to obtain material, but they have exhausted the market on special lines which control their production, and have apparently given up attempts to buy steel which cannot be delivered. There are not so many distress inquiries for large quantities of bars from manufacturers who usually buy direct from mills.

**Cast Iron Pipe.**—No large lettings were reported in the West for the past week, but there is a good run of orders from smaller municipalities. It is a notable feature of the market that the small towns and cities show more activity than the large cities in their purchases of water pipe. On current business we quote, per net ton, Chicago, as follows: Water pipe, 4-in., \$28.50; 6 to 12 in., \$27.50; 16-in. and up, \$26.50, with \$1 extra for gas pipe.

**Metals.**—There is a fair amount of business being done in copper in the Chicago market, and some good sales have been made to consumers. Prices are a shade lower. The price of tin varies from day to day, but not enough to affect the jobbing price to consumers. Spelter is dragging again, and on large lots is reported as low as 5c., East St. Louis, equal to 5.05c., Chicago. We quote Chicago prices as follows: Casting copper, 12½c.; lake, 13c., in carloads, for prompt shipment; small lots, ¼c. to ¾c. higher; pig tin, car lots, 33½c.; small lots, 35c.; lead, desilverized, 4.30c. to 4.35c., for 50-ton lots; corroding, 4.55c. to 4.60c. for 50-ton lots; in carloads, 2½c. per 100 lb. higher; spelter, 5.25c. to 5.30c.; Cookson's antimony, 10½c., and other grades, 9½c. to 10½c.; sheet zinc is \$7.50, f.o.b. La Salle, in carloads of 600-lb. casks. On old metals we quote for less than carload lots: Copper wire, crucible shapes, 12½c.; copper bottoms, 10½c.; copper clips, 12½c.; red brass, 10½c.; yellow brass, 9½c.; light brass, 7c.; lead pipe, 4¼c.; zinc, 4¼c.; pewter, No. 1, 24c.; tin foil, 26c.; block tin pipe, 30c.

**Old Material.**—Steel melting scrap and railroad malleable are quoted lower this week, but in other lines there is stubborn resistance to influences that have depressed the market for several weeks. In the case of heavy melting steel local buyers are restricting deliveries and old contracts on which dealers have been covering are running out. Short rails are a drug on the market, owing to the lack of demand from the malleable foundries. There is a good demand for agricultural malleable scrap, but railroad malleable is very hard to place with consumers and has sold down almost at par with agricultural grades in the case of recent lots of railroad scrap which dealers had to move. One lot of 600 tons of railroad malleable sold last week below \$12, delivered. The steel foundries which work on railroad con-



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tracts are evidently as short of new orders as the railroad malleable foundries. Couplers, knuckles and railroad springs, for which the steel foundries often pay high prices, are quoted lower and are now selling very cheap. The rolling mills are taking advantage of the low prices now prevailing to increase their stocks of scrap, and they apparently have more confidence in the future of the market. There have been liberal offerings by railroads the past two weeks, amounting to 25,000 or 30,000 tons, and it is understood that most of the material on their lists was sold. Following prices are per gross ton, delivered, Chicago:

Old iron rails.....	\$17.00 to \$17.50
Old steel rails, rerolling.....	16.50 to 17.00
Old steel rails, less than 3 ft.....	14.00 to 14.50
Relaying rails, standard sections, subject to inspection.....	24.00 to 25.00
Old car wheels.....	15.50 to 16.00
Heavy melting steel scrap.....	13.00 to 13.50
Frogs, switches and guards, cut apart.....	13.00 to 13.50
Shoveling steel.....	12.50 to 13.00

The following quotations are per net ton:

Iron angles and splice bars.....	\$15.00 to \$15.50
Iron car axles.....	20.00 to 20.50
Steel car axles.....	20.00 to 20.50
No. 1 railroad wrought.....	12.75 to 13.25
No. 2 railroad wrought.....	11.75 to 12.25
Springs, knuckles and couplers.....	12.00 to 12.50
Locomotive tires, smooth.....	17.00 to 17.50
No. 1 dealers' forge.....	11.00 to 11.50
Steel axle turnings.....	9.50 to 10.00
Machine shop turnings.....	8.00 to 8.50
Cast and mixed borings.....	5.00 to 5.50
No. 1 busheling.....	10.50 to 11.00
No. 2 busheling.....	8.00 to 8.50
No. 1 boilers, cut to sheets and rings.....	9.50 to 10.00
No. 1 cast scrap.....	13.00 to 13.50
Stove plate and light cast scrap.....	11.00 to 11.50
Railroad malleable.....	12.00 to 12.50
Agricultural malleable.....	11.50 to 12.00
Pipes and flues.....	9.50 to 10.00

## Philadelphia

PHILADELPHIA, Pa., June 14, 1910.

The market is by no means strong and there is an apparent drift toward lower prices. Consumers appear to be meeting with more success in obtaining concessions both in crude and finished materials, as a result of which a disposition to withhold business and await further developments is to be noted. Irregular buying characterizes the market in nearly all branches of the trade and competition for what there is offered is considerably stronger, inasmuch as producers are, in many cases, none too well booked up on forward business. For desirable specifications heavy plates can be had at 1.65c., delivered, while shapes are weak at 1.60c. Open hearth rolling billets are dull, at \$28.50 to \$29, delivered here. Coke continues quiet, but old material is sentimentally stronger. The arrangement under which a number of the large Eastern rolling mills will buy their scrap supply through a central purchasing agent has, it is understood, been consummated.

**Pig Iron.**—With slight price concessions from recent quotations available, buyers have developed a waiting tendency and, while inquiries have come out quite freely, they have been largely for the purpose of testing the market. The most important inquiry during the week has been that of the Pennsylvania Railroad Company for a minimum of 3000 and a maximum of 6000 tons of foundry and 750 tons of charcoal iron, for delivery at its Altoona shops during the third quarter, which is expected to develop into actual business at an early date. Other inquiries range from carloads to occasional 1000 ton lots, but prospective buyers show considerable hesitancy in placing orders, or take only sufficient tonnage to meet immediate needs. Foundry iron continues the only grade in which there has been any movement, and at that business has been comparatively light. Prices show more irregularity; some makers of standard brands maintain quotations of \$17 for No. 2 X foundry, delivered in this territory, others openly quote \$16.75, delivered, while in a few instances, on irons probably not so well established, \$16.50 can be done for desirable business, or where competition is sharp. There is less spread between the prices of No. 2 X and No. 2 plain, and this grade is pretty generally quoted at \$16.50, delivered, although in instances \$16.25 might be done. Prices on Virginia foundry grades are quoted at \$14, furnace, although it is reported that this price has been shaded, and in some cases makers refuse to sell at less than \$14.25, furnace; very little business has, however, been done. Cast iron pipe foundries have been picking up odd lots of Southern iron, mostly mixed grades, aggregating upward of a thousand tons. Recent sales of this character will total several thousand tons. Makers and buyers of Northern low grade iron are still apart on their views of prices, consumers holding at about \$15.25, delivered, for iron of that character. Little movement in forge iron for mill purposes is to be noted, a few sales are reported at prices ranging from \$15.50 to \$15.75, delivered, according to destination. Basic iron is still inactive, and sellers have in instances offered this grade

freely at \$16, delivered, without buyers showing any interest in the market. The majority of the buyers are pretty well covered for their third quarter requirements. Sales of moderate lots of low phosphorus iron continue to be made at recent quotations for standard brands. While deliveries on contracts are being freely taken, the absence of new business is having its effect on the market, particularly where it is necessary for makers to move their stocks. The following range of quotations is named for delivery in buyers' yards in this district, for either prompt or third quarter, and in some cases for entire second half shipment:

Eastern Pennsylvania, No. 2 X foundry.....	\$16.75 to \$17.00
Eastern Pennsylvania, No. 2 plain.....	16.50 to 16.75
Virginia, No. 2 X foundry.....	16.75 to 17.25
Virginia, No. 2 plain.....	16.75 to 17.00
Gray forge.....	15.75 to 16.00
Basic.....	16.25
Standard low phosphorus.....	23.00 to 23.25

**Ferromanganese.**—Occasional scattered inquiry is to be noted; one Eastern consumer is in the market for 600 to 900 tons for delivery over the first half of 1911, but the market generally is in unsatisfactory shape. Prices are not strong; \$40, Baltimore, is nominally quoted for 80 per cent. ferro, but this price could, no doubt, be shaded.

**Billets.**—Mills are pretty well fixed for immediate business, although not heavily booked for deliveries after the first half. Buyers continue to withhold business in hope of better prices, which show a downward tendency. What little business comes out is for urgent shipment. Standard open hearth rolling billets for prompt or third quarter shipment are quoted from \$28.50 to \$29, delivered in this vicinity. Forging billets are a trifle firmer at \$31 to \$32, Eastern mill, the usual extras applying for high carbons and special sizes.

**Plates.**—Prices have developed weakness, owing largely to the anxiety of some makers to put on tonnage. As a rule orders have been mostly of a miscellaneous character, although some few mills have booked a fair volume of business. Considerable interest is being taken by the trade in the opening of bids by the Government, June 15, for a very heavy tonnage of plates for Panama Canal work. Lower quotations are named by some mills for orders on which the specifications are considered desirable, 1.65c. to 1.70c. being quoted for ordinary plates delivered in this vicinity.

**Structural Material.**—Business placed has been mostly of an unimportant character. One fair lot, comprising about 1200 tons, for an office building, was let, but the bulk of the orders in this vicinity have been small. Mills are not very actively engaged, and competition of what business develops is quite sharp. Prices are not strong, although the minimum open quotation for plain shapes is still 1.00c., delivered in this territory.

**Sheets.**—A very fair day to day business is reported and mills in this neighborhood continue fully engaged. Individual orders are, as a rule, rather small and for early delivery. The aggregate tonnage, however, is considered satisfactory. Prices are unchanged, the following range being named for early shipment: Nos. 18 to 20, 2.80c.; Nos. 22 to 24, 2.90c.; Nos. 25 and 26, 3c.; No. 27, 3.10c.; No. 28, 3.20c.

**Bars.**—A lighter demand is reported for refined iron bars and prices have in instances been shaded, without, however, stimulating business to any marked degree. Steel bars are still in active demand, but delayed deliveries restrict orders. For delivery in this vicinity prices show a slightly wider range, as some makers have not met the lower quotations named by others, 1.47½c. to 1.55c. representing the range of the market for refined iron bars. Steel bars are firm at 1.60c., delivered.

**Coke.**—Some inquiry is before the trade, but orders develop slowly. The business placed has been largely for near future delivery, although an occasional contract for second half furnace coke is reported. Prices are unchanged, foundry coke being quoted at \$2.25 to \$2.50, at ovens; furnace coke, \$1.65 to \$1.85, at ovens, for second half delivery. The following range of prices per net ton represents quotations for delivery in buyers' yards in this district:

Connellsville furnace coke.....	\$4.00 to \$4.15
Foundry coke.....	4.50 to 4.75
Mountain furnace coke.....	3.00 to 3.75
Foundry coke.....	4.10 to 4.35

**Old Material.**—Market conditions show little change. Higher bids for some of the railroad offerings have given a better sentimental tone to the market, which, however, has not been backed up with orders from consumers. The feature of interest to the trade has been the adoption of a plan by some five of the larger rolling mills in this district to buy their supplies of old material through the same central purchasing agent that represents the leading steel mills in that capacity. This arrangement meets with pronounced disfavor on the part of the merchants, as they contend it limits their field of purchasers to a considerable degree. Sales have been principally in small lots, in instances not sufficient busi-

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ness being transacted to establish a market. Quotations are still nominal to a large extent, the following range representing those at which business could be done, delivered in buyers' yards in this vicinity:

No. 1 steel scrap and crops.....	\$14.50 to \$15.00
Old steel rails, rerolling.....	16.50 to 17.00
Low phosphorus.....	20.00 to 20.50
Old steel axles.....	20.50 to 21.50
Old iron axles.....	26.50 to 27.50
Old iron rails.....	20.00 to 20.50
Old car wheels.....	15.00 to 15.50
No. 1 railroad wrought.....	16.50 to 17.00
Wrought iron pipe.....	15.00 to 15.50
No. 1 forge fire.....	12.50 to 13.00
No. 2 light iron.....	8.50 to 9.00
Wrought turnings.....	9.75 to 10.25
Cast borings.....	8.50 to 9.00
Machinery cast.....	15.00 to 15.50
Railroad malleable.....	14.50 to 15.00
Grate bars.....	12.50 to 13.00
Stove plate.....	10.00 to 10.50

J. K. Dimmick & Co., iron, steel, coal and coke merchants, Land Title Building, Philadelphia, Pa., have opened a branch office in the Fairmount Trust Boulding, Fairmount, W. Va., Mr. Theodore Werkman being in charge.

## Cleveland

CLEVELAND, OHIO, June 14, 1910.

**Iron Ore.**—Ore shipments down the lakes continue heavy in spite of the fact that few consumers are ready to take their ore. Under the circumstances some of the shippers feel that shipments will not keep up at the rate tonnage is now being moved. Much of the ore is being piled on the docks, which are already well filled. Unless the situation improves later in the season it is believed that some of the ore sold for this season's delivery will be left in the mines until next year. No new inquiries are coming out. We quote as follows, per gross ton: Old Range Bessemer, \$5; Mesaba Bessemer, \$4.75; Old Range non-Bessemer, \$4.20; Mesaba non-Bessemer, \$4.

**Pig Iron.**—A fair volume of inquiry continues to come out, but not a large tonnage is being sold. The market is weak and many of the buyers who have had inquiries out recently are still holding off. The Babcock & Wilcox Company, which had an inquiry out for 5000 tons of foundry iron for its Barberton, Ohio, plant, for last half delivery, has decided to postpone its purchase. While not much tonnage is being placed in this immediate territory, one local interest reports sales of foundry and malleable iron during the week aggregating about 10,000 tons, and several inquiries for round lots of foundry, malleable and basic. In the Valley quotations on No. 2 foundry are being shaded to \$14.75 for the last half delivery, and that grade is being offered at \$14.50 for spot shipment. Several of the producers are refusing to meet these prices, quoting \$15 as a minimum for No. 2. The sale of 700 tons of Northern foundry to an Akron, Ohio, foundry for the last half is reported. A local malleable castings company has bought about 4000 tons of malleable for its Indianapolis plant at about \$15 for the last half, and a northern Ohio malleable iron foundry has bought 1500 tons of malleable for the last quarter at \$15. One sale of 500 tons of malleable is reported at \$15.50. Several sales of small lots of Southern foundry are reported at \$12, Birmingham, for the last half. The local market seems to be firm at that price, and several lower offers have been refused. A leading manufacturer of plumbers' goods is in the market for 2000 tons of Southern iron for its Louisville plant for early delivery. For prompt shipment and last half we quote, delivered, Cleveland, as follows:

Bessemer.....	\$16.65 to \$16.90
Northern foundry, No. 1.....	16.00 to 16.25
Northern foundry, No. 2.....	15.40 to 15.90
Northern foundry, No. 3.....	15.00 to 15.40
Gray forge.....	15.40
Southern foundry, No. 2.....	16.10 to 16.35
Jackson Co. silvery, 8 per cent. silicon.....	20.00 to 20.50

**Coke.**—The market is very dull. The Cleveland interest which was reported last week as having bought one-third of its requirements of 150,000 tons of furnace coke for the last half has not yet purchased the remainder. There is very little inquiry for foundry grades. We quote standard Connellsville furnace coke at \$1.55 to \$1.65 per net ton, at oven, for spot shipment, and \$1.75 to \$1.85 for the last half. Connellsville 72-hour foundry coke is held at \$2.15 to \$2.30 for spot shipment and \$2.25 to \$2.50 for the last half.

**Finished Iron and Steel.**—While the outlook shows an improvement, the demand in finished lines has not been active during the week. Practically all the large consumers of steel bars in this territory are now under contract for their requirements during the balance of the year, so that little is now being done in the way of placing contracts. Specifications are somewhat lighter. Jobbers report only a small volume of mill orders, but their warehouse business continues heavy, and they are still having trouble in getting deliveries

from the mills as fast as desired. In structural lines considerable new work is pending, but much of it is dragging along. In some cases it is believed that the asking for bids is being postponed in the hope of getting lower prices. The contract for the 12-story store and office building to be built on Euclid avenue by the City Investment Company has been let to the Forest City Steel & Iron Company of Cleveland. It will require 825 tons of steel. There is an inquiry out for 300 tons for a power house for the Cuyahoga County Court House. Bids will be asked for shortly for the Cleveland Athletic Club Building, which will require about 1000 tons. We quote structural material at 1.50c., Pittsburgh, but small lots continue to bring 1.55c. The demand for plates is only fair, the general price being 1.50c., Pittsburgh. Local mills are well filled with orders. The demand for sheets is light and prices are weak, the usual concessions on black and galvanized being from \$2 to \$3 a ton. There is only a light demand for iron bars, although local mills have enough orders on hand to keep running for a few weeks. We quote iron bars, 1.45c., Cleveland.

**Old Material.**—The market is as dull as it has been at any time during the past few months and prices continue to decline. In the absence of transactions quotations are largely nominal, although we note reduction in prices on several grades. Mills are taking very little scrap, and as some of them are expected to shut down for a week or two during the latter part of the month, no improvement is looked for in the next few weeks, and it is believed that bottom prices have not yet been reached. A few of the yard dealers who have not already bought much for stock are in the market for scrap at bargain prices. The Norfolk & Western Railroad has a list out of about 2500 tons to be closed June 16. Dealers' prices, per gross ton, f.o.b. Cleveland, are as follows:

Old steel rails.....	\$15.00 to \$15.50
Old iron rails.....	17.00 to 17.50
Steel car axles.....	21.00 to 21.50
Heavy melting steel.....	13.50 to 14.00
Old car wheels.....	14.00 to 14.50
Relaying rails, 50 lb. and over.....	22.50 to 23.50
Agricultural malleable.....	12.00 to 12.50
Railroad malleable.....	13.50 to 14.00
Light bundled sheet scrap.....	9.75 to 10.25

The following prices are per net ton, f.o.b. Cleveland:

Iron car axles.....	\$21.50 to \$22.00
Cast borings.....	6.25 to 6.75
Iron and steel turnings and drillings.....	7.00 to 7.50
Steel axle turnings.....	9.50 to 10.00
No. 1 bushelling.....	12.00 to 12.50
No. 1 railroad wrought.....	14.00 to 14.50
No. 1 cast.....	12.50 to 13.00
Stove plate.....	11.00 to 11.50
Bundled tin scrap.....	11.00 to 11.50

## Cincinnati

CINCINNATI, OHIO, June 15, 1910.—(By Telegraph.)

Among consumers in this market the waiting policy inaugurated some time ago is still pronounced, excepting agricultural implement makers and a few of the stove manufacturers. The first named have placed orders during the week for steel bar requirements for the year ending July 1, 1911, aggregating several thousand tons. These contracts were made on a 1.45c., Pittsburgh, basis. Other finished material items, except structural shapes, have also been active. Some pig iron consumers who had an inquiry out a month or so ago for last half needs and deferred purchasing because their ideas of price were lower than furnace quotations, have come out again with feelers, and there are also some inquiries for the first quarter and half of next year. Southern furnacemen, particularly, named no prices, although some Northern basic was quoted for first half delivery on a basis of \$16, Ironton. Old material is still very weak.

**Pig Iron.**—Greater variety characterizes the inquiry this week, although no large tonnage of any grade is specified. The largest calls for about 2500 tons of Nos. 3 and 4 Northern and Southern foundry iron. Some high silicon is inquired for by a manufacturer of pumping machinery in south central Ohio and is for last half delivery. A stove works in Ohio which had an inquiry out a few weeks ago for 500 tons of Nos. 2 and 3 foundry, and did not buy, is again asking prices. While there seems to be little or no spot business, it is conceded that \$11.50, Birmingham, can easily be done, but \$12 seems to be the absolute minimum for last half business, and practically all the furnaces in the Birmingham district, and at least one in Tennessee, are restricting deliveries at this price to the third quarter. The demand for low grades is not nearly so great, but the asking price of No. 4 foundry and forge is unchanged, nothing better than \$11 is heard. Northern iron is unchanged, although the price is closer to \$15, Ironton, for No. 2 foundry, for last half delivery, than the \$15.50 asked by some interests. Some exceedingly low prices have been made during the week on Virginia irons into east central Ohio, \$14.25 and \$14.50, Virginia furnace, being frequently heard in this connection.



# THE IRON AND METAL MARKETS

There are a number of inquiries for tonnages ranging from one to two carloads to 100 tons of silvery Northern high phosphorus, high manganese, Lake Superior charcoal and malleable. One large Southern interest making high manganese is reported to have refused \$13, Birmingham, on a 300-ton order. The Southern interests, most aggressive a few days ago at the \$11.50 figure, have either withdrawn or announce \$12 as their absolute minimum. An Ohio manufacturer of sanitary goods is getting prices on 800 tons of foundry iron. This business will probably go to Virginia furnaces. Some automobile concerns in Detroit territory are also asking prices on iron for last half. A large agricultural manufacturing interest in northern Ohio is asking prices. Inquiry for malleable and basic has fallen off. A price of \$16, Ironton, was made by a large interest for deliveries extending through the first half of 1911. For immediate delivery and through the last half of the year, based on freight rates of \$3.25 from Birmingham and \$1.20 from Hanging Rock district, we quote, f.o.b. Cincinnati, as follows:

Southern coke, No. 1 foundry.....	\$15.50 to \$15.75
Southern coke, No. 2 foundry.....	15.00 to 15.25
Southern coke, No. 3 foundry.....	14.75 to 15.00
Southern coke, No. 4 foundry.....	14.50
Southern coke, No. 1 soft.....	15.50 to 15.75
Southern coke, No. 2 soft.....	15.00 to 15.25
Southern gray forge.....	14.25
Ohio silvery, 8 per cent. silicon.....	19.70
Lake Superior coke, No. 1.....	16.70 to 17.20
Lake Superior coke, No. 2.....	16.20 to 16.70
Lake Superior coke, No. 3.....	15.70 to 16.20
Standard Southern car wheel.....	25.25 to 25.75
Lake Superior car wheel.....	22.25 to 22.75

(By Mail.)

**Coke.**—The low prices in the Connellsville district are well confined to spot deliveries on foundry grades, for which a fair demand is noted. There is some contracting for a year from July 1 on foundry business, and standard brands are bringing \$2.40 to \$2.50; some outside brands are reported as low as \$2.15. Prices in the Wise County field range about the same; although the price of \$2.25 flat is most frequently heard, and this price also rules for spot deliveries. There is some inquiry from furnaces in the Ironton district for coke supplies for the year from July 1. Pocahontas furnace on contract is quotable at \$1.85 to \$2, and foundry \$2.10 to \$2.25. Some spot Pocahontas furnace grades are obtainable at \$1.75. In the Connellsville district some sales of furnace grades are reported as low as \$1.65, at ovens.

**Finished Iron and Steel.**—Mill shipments and contracts of any size have fallen off, and the market in this respect is very quiet, but there is a steady demand from all parts of the central territory for small lots. Warehousing is reported excellent by all concerns. Specifications are only fair, and there is not much new work in sight in this territory. Shapes and plates are quoted at 1.65c., Cincinnati, in carload lots, and out of stock, 2c., but 1.45c., Pittsburgh, is being done quietly on plates in large lots. Orders which are practically all for immediate shipment average about 50 tons. Steel bars are quotable at 1.60c., Cincinnati, on carload shipments and out of stock, 1.90c., base, half extras. Iron bars are weak at 1.55c. to 1.60c., Cincinnati mills, and out of stock in small lots, 1.85c. Nothing of any size is in sight in this immediate vicinity, bids on the new Memphis, Tenn., Union Passenger Depot are expected to be awarded and announced within a few days. About 800 tons will be required.

**Old Material.**—Local dealers are not agreed on the price of scrap, save that there is no business at any price, and it is now rather an individual question than a community market. The large dealers are resisting, and it is reported successfully, efforts of some mill interests to cancel contracts. There is more interest in relayers, apparently, than any other item in the list, and they have firmed up 50c. to \$1 since last week. Cast borings are selling very low by some concerns, while others who buy on a sliding scale regulated by the price of pig iron are holding for better prices. The largest dealers do not anticipate better conditions for several months, and in a few instances these dealers refuse to quote, averring that they do not know how to do so in the absence of inquiry and demand. As nearly as the market can be gauged under these conditions, dealers asking prices for delivery in Cincinnati and southern Ohio are as follows:

No. 1 railroad wrought, net ton.....	\$11.50 to \$12.00
Cast borings, net ton.....	4.00 to 5.00
Heavy melting steel scrap, gross ton...	11.50 to 12.00
Steel turnings, net ton.....	6.50 to 7.50
No. 1 cast scrap, net ton.....	11.00 to 12.00
Burnt scrap, net ton.....	8.00 to 9.00
Old iron axles, net ton.....	16.50 to 17.00
Old iron rails, gross ton.....	17.00 to 17.50
Old steel rails, short, gross ton.....	14.50 to 15.50
Old steel rails, long, gross ton.....	14.50 to 15.50
Relaying rails, 56 lb. and up, gross ton.	22.00 to 23.00
Old car wheels, gross ton.....	13.00 to 13.50
Low phosphorus scrap, gross ton.....	16.00 to 16.50

## Buffalo

BUFFALO, N. Y., June 14, 1910.

**Pig Iron.**—The week has shown a fair amount of activity in this territory, both in inquiry and in placement. Consumers are evidently becoming more anxious to place contracts than during the preceding week. There has been 30,000 to 40,000 tons, principally foundry grades, under negotiation, and a considerable of this has been placed, or is upon the point of being closed. Some of this tonnage has apparently been bought quietly at slight concessions from the current prices, but most of the Buffalo district producers state there has been no quotable change from last week's schedule, which is being closely adhered to. While undoubtedly there is still an overproduction of pig iron in the country at large, it does not apply to this section, as Buffalo furnace stocks are being steadily reduced. We quote as follows per gross ton, f.o.b. Buffalo:

No. 1 X foundry.....	\$16.00 to \$16.50
No. 2 X foundry.....	15.50 to 16.00
No. 2 plain.....	15.25 to 15.75
No. 3 foundry.....	15.00 to 15.50
Gray forge.....	15.00 to 15.50
Malleable.....	16.75 to 16.25
Basic.....	15.50 to 16.00
Charcoal.....	19.25 to 19.75

**Finished Iron and Steel.**—There has been a notable increase in inquiry for all finished products as compared with the previous week. The bar market is very strong, with some improvement in deliveries. On hot rolled steel deliveries are now running from three to four months, with some sizes obtainable in 60 days. In cold rolled material the demand is active, with deliveries running six to eight weeks. In cold drawn material, screw stock quality, deliveries are still about 90 days. Prices are firm. The Canadian export trade continues active. The local agency of the principal interest reports a number of good sized contracts closed for bar products, including hoop iron and tubes and for plates and shapes. In fabricated material the week has developed a good demand and several new building projects will soon be ready for figuring. Bids will be received very shortly for steel for a store and office building to be erected by Hardin H. Littell, Buffalo, requiring about 250 tons, and for a store and warehouse building for Keiser & Bonaberg, tobaccoists, about 450 tons; also for the new Sherman House, Jamestown, N. Y., about 800 tons. Bids went in last week for structural steel for a bridge over the Oswego River and the Erie Barge Canal at Fulton, N. Y., for the Syracuse, Lake Shore & Northern Electric Railway, taking about 500 tons. The Buffalo Structural Steel Company has received contract for the fabrication and erection of the steel for the remodeling of the Cliff Paper Company's warehouse building at Niagara Falls, N. Y., 150 tons.

**Old Material.**—The demand from consumers continues very light. There is a little more inquiry than was evident a week ago, however, especially from districts outside of Buffalo territory, and the feeling among dealers is a shade better. Prices are unchanged and nominal as follows, per gross ton, f.o.b. Buffalo:

Heavy melting steel.....	\$13.50 to \$14.00
Low phosphorus steel.....	18.50 to 19.00
No. 1 railroad wrought.....	15.50 to 16.00
No. 1 railroad and machinery cast scrap.	14.50 to 15.00
Old steel axles.....	18.00 to 18.50
Old iron axles.....	22.75 to 23.25
Old car wheels.....	15.00 to 15.50
Railroad malleable.....	15.00 to 15.50
Boiler plate.....	12.00 to 12.50
Locomotive grate bars.....	11.50 to 12.00
Pipe.....	11.50 to 12.00
Wrought iron and soft steel turnings..	7.25 to 7.75
Clean cast borings.....	6.00 to 6.50
No. 1 busheling scrap.....	12.50 to 13.00

## Birmingham

BIRMINGHAM, ALA., June 13, 1910.

**Pig Iron.**—The market price for prompt shipments or deliveries to cover the remainder of this year has not changed despite the comparatively small demand. Producing interests generally reiterate their statements that the \$12, Birmingham, schedule does not afford sufficient margin to admit of shading, but these so far have had but little effect in changing the views of the melting interests and a quiet market is expected. The melters of low grade iron have been most interested in recent developments, as a result of the general inclination toward a more economical mixture and the fact that the production of such grades has been reduced more in proportion than that of higher grades. Within the past week lots of gray forge have readily brought \$10.75 per ton, or a premium of 25c. a ton over the corresponding \$12, Birmingham, basis for No. 2 foundry, while mottled iron sold for \$10.60 per ton, or a premium of 60c. per ton. The inquiry for mottled and gray forge is good, and where those grades are not available No. 4 foundry is being substituted.

## THE IRON AND METAL MARKETS

The inquiry for high manganese is also fairly satisfactory and has resulted in a higher price for a favorite brand. Attractive tonnages of Nos. 2 and 3 foundry have recently been offered on a basis of \$11.50 for No. 2, but these offers have not had serious consideration, except for high phosphorus iron to be shipped from points taking a lower freight rate than Birmingham.

**Cast Iron Pipe.**—One or more round tonnage contracts are under consideration, but no date of letting has yet been announced. In small lots the market is understood to be fairly active. It is noted that the recent requirement of small municipalities for extensions have aggregated quite an attractive volume of business, and the prices that have been received in such transactions are very satisfactory. Current quotations are unchanged, but in the absence of letting of sufficient importance to test the strength of quotations we quote nominally: Water pipe, 4 to 6 in., per net ton, \$23; 8 to 12 in., \$22; over 12-in., average \$21, with \$1 per ton extra for gas pipe.

**Old Material.**—The amount of this material moving to local yards is considerably larger than at the time of last report, due to the disposition of dealers to take advantage of prevailing low prices. It cannot be said that these prices are attractive to consumers and the market is really in a very stagnant condition. Our quotations are left unrevised. Sellers believe that reductions would hardly result in more activity, because of the stocks now in consumers' yards. We quote dealers' asking prices as follows, per gross ton, f.o.b. cars here.

Old iron axes.....	\$17.00 to \$17.50
Old iron rails.....	13.00 to 13.50
Old steel axes.....	16.50 to 17.00
No. 1 railroad wrought.....	12.00 to 12.50
No. 2 railroad wrought.....	9.50 to 10.00
No. 1 country wrought.....	9.00 to 9.50
No. 2 country wrought.....	8.50 to 9.00
No. 1 machinery.....	10.50 to 11.00
No. 1 steel.....	9.50 to 10.00
Tram car wheels.....	10.00 to 10.50
Standard car wheels.....	11.50 to 12.00
Light cast and stove plate.....	7.50 to 8.00

No. 1 Furnace of the Alabama Consolidated Coal & Iron Company at Gadsden, Ala., has been put in operation, after having been relined.

The furnace of the Shelby Iron Company at Shelby, Ala., which has been producing charcoal iron, has been blown out for relining.

### St. Louis

ST. LOUIS, Mo., June 13, 1910.

**Coke.**—Buyers are not holding off for lower prices so much as to post themselves respecting their probable requirements, based on prospective business conditions. One house reports closing a good sized contract for Connellsville foundry coke, shipment over the second half, and has some inquiries still pending. The market is steady and unchanged at \$2.35 for prompt and \$2.50 for contract, per net ton, for 72-hour standard Connellsville, f.o.b. oven.

**Pig Iron.**—The leading sales agencies report a quiet market, the largest business mentioned by any one office being sales of two lots of 400 tons and one of 300 tons of No. 2 foundry. There is a quite general inquiry, partly with a view to buying and to some extent for keeping posted. All the foundries, especially the steel plants, are very busy. The tone of the market is firmer. Generally No. 2 Southern foundry is held at \$12, and some agencies are instructed not to submit offers below this price for any delivery. A factor of weakness now apparent is in the case of furnaces that are coming to the end of their contracts and that have considerable iron in their yards. We quote No. 2 Southern foundry at \$12, f.o.b. Birmingham, for shipment over the second half; Southern Ohio iron at \$15, f.o.b. furnace.

**Lead, Spelter, Etc.**—The market for lead is firm but quiet at 4.20c. to 4.25c. for Missouri. Spelter is dull and slow at 5c. to 5.05c., East St. Louis. Tin is off 7½c. per 100 lb.; antimony ¼c. lower; copper unchanged. The demand for finished metals has been light in the past week.

**Old Material.**—While there is no improvement in business there are numerous small transactions, both with consumers and among the dealers. It is believed that after July 1 demand will be better from mills and foundries. On some items prices have fallen about 50c. a ton. No railroad offerings were on the market last week. Relaying rails continue in short supply and, being urgently wanted, bring a stiff price. We quote dealers' prices as follows, per gross ton, f.o.b. St. Louis:

Old iron rails.....	\$15.00 to \$15.50
Old steel rails, rerolling.....	14.50 to 15.00
Old steel rails, less than 3 ft.....	13.50 to 14.00
Relaying rails, standard sections, sub- ject to inspection.....	26.00 to 26.50
Old car wheels.....	15.00 to 15.50
Heavy melting steel scrap.....	13.50 to 14.00
Frogs, switches and guards, cut apart.....	13.50 to 14.00

The following quotations are per net ton:

Iron fish plates.....	\$14.00 to \$14.50
Iron car axles.....	21.00 to 21.50
Steel car axles.....	19.50 to 20.00
No. 1 railroad wrought.....	13.50 to 14.00
No. 2 railroad wrought.....	12.50 to 13.00
Railway springs.....	12.00 to 12.50
Locomotive tires, smooth.....	16.50 to 17.00
No. 1 dealers' forge.....	11.00 to 11.50
Mixed borings.....	6.50 to 7.00
No. 1 bushing.....	11.00 to 11.50
No. 1 boilers, cut to sheets and rings.....	9.50 to 10.00
No. 1 cast scrap.....	12.50 to 13.00
Stove plate and light cast scrap.....	9.50 to 10.00
Railroad malleable.....	10.50 to 11.00
Agricultural malleable.....	10.00 to 10.50
Pipes and flues.....	9.25 to 9.75
Railroad and tank scrap.....	8.50 to 9.00
Railroad grate bars.....	9.50 to 10.00
Machine shop turnings.....	9.00 to 9.50

Notice of increase in the capital stock of the Corrugated Bar Company of St. Louis from \$75,000 to \$500,000 has been filed with the Recorder of Deeds. The assets are put at \$1,158,147.95 and the liabilities at \$616,914.74. D. E. Garrison is the president of the company.

The Collinsville Electric Company of Collinsville, Ill., has been incorporated; capital stock, \$100,000. The incorporators are J. J. Frey, A. W. Crawford and E. B. Hess. The company will engage in the manufacture and sale of gas, steam, hot water and electric current.

### San Francisco

SAN FRANCISCO, CAL., June 8, 1910.

In the Pacific Coast market the general movement remains on about the same scale as for the last two months. In some quarters there is a greater tendency to limit purchases, but most consuming interests have been buying conservatively and are in the market for current requirements. There is a general reluctance to place orders for distant requirements at present, as merchants and some large consumers have found the volume of spring business below anticipations, and are carrying a considerable stock of material. Structural material, while more active than last month, is still quiet. The tonnage of merchant pipe is very small, with scarcely any business from the jobbing trade, and a smaller buying movement in the oil fields. Plates continue fairly active and bars are in good demand. Light rails are also moving more freely. Conditions are encouraging in cast iron pipe.

**Plates.**—A very fair tonnage is being taken for miscellaneous riveted pipe work, and tank manufacturers are still buying for work in connection with the oil interests. The movement is larger than usual, and will probably continue so for some time. The Union Oil Company is working on a project for the construction of a number of large tanks at San Luis Obispo, Cal.

**Bars.**—The demand either for reinforcing or manufacturing purposes is rather quiet, but the jobbing movement in the interior shows some improvement. The bulk of this business is still going to foreign mills, but the requirements are sufficiently large to bring a fair volume of business to domestic interests. Jobbers' prices are firmly held, bars from store, San Francisco, being quoted at 2.50c. for steel and 2.30c. for iron.

**Rails.**—While recent arrivals of light rails of foreign origin have been rather large, the demand has increased materially within the last month and supplies in store have been considerably reduced. Jobbers are buying from domestic mills to a larger extent than for some time. Fruit interests are still in the market for the lightest sections, and purchases for the mines appear to be a little larger than during the spring, though still light.

**Structural Material.**—Local building permits for May aggregate \$2,447,007, a slight increase over April and about a normal figure. While most of the present work is of fire-proof construction, the majority of buildings are small and require little or no structural steel. Building continues active at Los Angeles and other Coast cities, but contracts for steel fabrication are smaller than the total figures would seem to indicate. The only job of importance in this city is the Olympic Club, amounting to about 800 tons, taken by Milliken Bros. The other jobs have gone to local contractors, for the most part at low prices. Local shops have not increased their operations for some time, and now have practically nothing on hand, though a few jobs are to come up in the near future. The Selling Building at Portland, Ore., amounting to about 800 tons, has been taken by Milliken Bros. Several other projects planned in that city some time ago have not recently been heard from. Contracts will probably be announced in a few days on two large court houses in the interior of California. The Native Sons' Building in San Francisco is expected to be let at any time. Work is gradually progressing on the San Francisco Library project, which will require a heavy tonnage, but no contracts are



## THE IRON AND METAL MARKETS

likely this year. Several appropriations have been made for new buildings at the University of California, Berkeley. Plans have been accepted for a \$140,000 building for the Y. M. C. A. at Honolulu, T. H. The local fabricating capacity was greatly increased to meet the requirements of rebuilding the city, and with this work about complete there is not enough business to keep the shops occupied. Beams and channels, 3 to 15 in., from store, San Francisco, are quoted at 2.70c.

**Merchant Pipe.**—The oil pipe business is liable to sudden fluctuations, as indicated by the fact that sales in the latter part of May and early June have been small. This is accounted for by the unexpected increase in oil production of late, which has exceeded all facilities for transportation or storage. The overproduction has caused the temporary suspension of preparations for new drilling projects, with a general cessation of orders for casing for fall delivery. Line pipe orders would be very acceptable to mill interests, but the promoters of several large projects are so far keeping out of the market. The distributive movement of the smaller sizes of merchant pipe is hardly normal, the local demand being closely limited, and as most merchants are overstocked practically nothing is being ordered from the mills. Some local jobbers have a very heavy tonnage in store, and 1000 tons, shipped last fall by sailing vessel, is due to arrive soon.

**Cast Iron Pipe.**—The United States Cast Iron Pipe & Foundry Company has taken an order for about 400 tons for an extension of the Oakland salt water system. Liberal orders have also been taken from the gas companies, both at San Francisco and Los Angeles, with smaller purchases by gas and water companies in the interior. Municipalities in this territory take a constantly increasing interest in cast iron pipe, which will probably result in a number of large orders during the next year. The city of Portland, Ore., will receive bids June 14 for 2400 ft. of 30-in. pipe, and bids will be taken on the same date by the town of El Centro, Cal., for 400 tons of pipe, with accessories.

**Pig Iron.**—Foundry interests are not yet inclined to make much provision for future requirements. Current needs are fairly well provided for by old contracts. There is a little more buying, however, than for a month past, with a fair inquiry from outside points. Local foundries are getting some municipal business and a moderate volume of architectural work, and there is a good demand for machinery castings at interior and southern California points. Prices still show some irregularity, but values are about as follows: English foundry iron, \$23 to 23.50; Scotch, \$25 to 25.50; Continental, \$23; Chinese, \$23; Southern, \$22.50.

**Old Material.**—Cast iron scrap remains quiet, though some local foundries have been in the market for moderate lots. Steel melting scrap is accumulating to some extent, but as the market has been fairly well cleaned up the amount on hand is by no means burdensome. Railroad wrought scrap and rerolling rails continue to find a ready market at about previous prices. Rails fit for relaying are also in good demand, especially light rails, which are wanted by mining interests. Prices remain about as follows: Cast iron scrap, gross ton, \$17; steel melting scrap, gross ton, \$10; railroad wrought scrap, net ton, \$14; rerolling rails, net ton, \$15.

### Metal Market

NEW YORK, June 15, 1910.

#### THE WEEK'S PRICES

Cents Per Pound.

	Copper.			Tin.	Lead.		Spelter.	
	Lake.	Electro-lytic.			New York.	St. Louis.	New York.	St. Louis.
June 9....	13.06	12.75		32.70	4.37½	4.22½	5.15	5.00
10....	12.87½	12.50		{ 32.75 32.80 }	4.37½	4.22½	5.15	5.00
11....	12.87½	12.50		32.90	4.37½	4.22½	5.15	5.00
13....	12.87½	12.50		32.80	4.37½	4.22½	5.15	5.00
14....	12.87½	12.50		32.70	4.37½	4.22½	5.15	5.00
15....	12.87½	12.50		32.60	4.37½	4.22½	5.15	5.00

The entire metal market is dull. Since the report of the Copper Producers' Association lake and electrolytic copper have fallen off noticeably, both in volume and prices. Lead is quiet, and there is so little buying of spelter that prices are only nominal.

**Copper.**—Following the copper producers' report, which showed heavy accumulations of stocks and light exports, the market has slumped rather badly. The United Metals Selling Company is doing nothing beyond keeping its quotation for lake copper at 13c. Other sellers have about decided that no action will be taken by this interest for the present in the readjustment of prices. Accordingly they have taken the initiative and are offering copper at various concessions. The market now is being made by the outsiders, and it is evident that there was more copper in their hands than was generally thought, as they are freely offering large

quantities at low figures. Electrolytic can easily be obtained at 12.50c., while lake is around 12.87½c. There have been some sales of outside lots of copper at 12.37½c. for electrolytic and 12.75c. for lake. Even at these low figures but little has been taken. Exports of copper so far this month have been 7427 tons, which is very light as compared with other months, and a most discouraging feature of the situation is that not much less than 7000 tons of copper has been imported during the month. In other words, Europe is shipping the metal back to us. The London market closed to-day with spot copper selling at £54 0s. 10d. and futures at £55 3s. 6d. The market was weak, and the sales amounted to 500 tons of spot and 1000 tons of futures.

**Pig Tin.**—The pig tin market is very dull and there was only one good trading day in the week. That came last Friday, when from 250 tons to 300 tons of tin changed hands. Most of this business was between dealers, although some of it went into the hands of consumers. The United States Steel Corporation, which was a good customer two weeks ago, is now out of the market. It can be seen by the daily quotations given above that pig tin has been below 33c. all the week, and from all accounts there is not much profit in it for sellers at present prices. Pig tin was sold in New York to-day for 32.60c. In London the market closed to-day with spot tin selling at £147 10s. and futures at £148 12s. 6d. The market was weak, and the sales were 120 tons of spot and 280 tons of futures.

**Lead.**—While the price of lead remains unchanged, the market is not as strong in tone as it was last week, as consumers seem to have supplied their wants for the time being. Contractors who were supporting the market by making good purchases for conduit work have apparently taken all they need, while the general manufacturing trade is buying but little. The outside interests continue to control the market prices, which are 4.37½c., New York, and 4.22½c., St. Louis.

**Tin Plates.**—The supply of tin plates is better and consumers who some time ago were obliged to pay premiums and wait for deliveries are now able to get immediate shipments at the prevailing price, which is \$3.84 for 100-lb. coke plates. The foreign tin plate market holds firm, and the demand in this country from the can manufacturers for tin plates for re-export is very good. The price at Swansea, Wales, remains at 13s. 3d.

**Spelter.**—The spelter market is stagnant and prices are only nominal. There is very little spelter in New York and most sellers are quoting prices on board cars at East St. Louis in reply to what few inquiries are being made. The nominal price of spelter here is 5.15c. and it is around 5c. at St. Louis.

**Antimony.**—The antimony market is very quiet and prices are weak. Hallett's is 8.12c. and Cookson's 8.57½c.

### New York

NEW YORK, June 15, 1910.

**Pig Iron.**—It may be said of the market that whatever large business is done is at concessions from the lowest prices heretofore quoted; also that knowledge of these concessions has not stimulated general buying. The average buyer of foundry iron seems content to wait, and it is chiefly the larger consumers who are willing to do business. Sales in the New York district in the past week have been light. In only two or three cases, so far as can be learned, have there been transactions greater than 500 tons, apart from purchases of low phosphorus iron made by New Jersey steel works, one of 3000 tons and another of 500 tons. A New Jersey foundry making light gray iron castings has bought several thousand tons of foundry grades. In New England the buying of two textile machinery manufacturers has attracted some attention. In one case it is believed 10,000 tons was taken, and in the other 3000 tons, in addition to purchases made by the second concern a short time ago. It is understood that less than \$17, delivered in New England, has been done in the week. Pipe makers are still in the market for low grade irons, and, finding only small offerings from the South, have sought to do business with Northern furnaces on the basis of \$15.25, delivered on the Delaware River, for No. 4. We quote Northern iron at tidewater as follows: No. 1, \$16.75 to \$17.25; No. 2 X, \$16.50 to \$16.75; No. 2 plain, \$16 to \$16.25. Southern iron is quoted at \$16.50 to \$16.75 for No. 1 and \$16 to \$16.25 for No. 2.

**Steel Rails.**—This has been the lightest week of the year in rails, the leading interest closing but a few scattering lots. The Colorado Fuel & Iron Company has taken an order for 1000 tons from the Stockton Terminal & Eastern Railway.

**Ferroalloys.**—The demand for ferromanganese is fair, and there are inquiries out for a number of small lots. The price quoted in this market is about \$40, seaboard, for this year's delivery. Very little interest is being taken in ferro-

## THE IRON AND METAL MARKETS

silicon. New York houses quote the market at \$59, Pittsburgh.

**Old Material.**—The demand for all kinds of scrap is light and prices correspondingly weak. No changes in quotations are given; in fact, there have hardly been transactions enough to determine the market. A few more railroad lists are out, further increasing the supply that is not actively sought. A dull trade is expected for the next three or four months. A persistent rumor has it that four rolling mills in Pennsylvania are planning to combine for the purpose of purchasing their scrap through one agent. Quotations per gross ton, New York and vicinity, are continued as follows:

Rerolling rails.....	\$12.50 to \$13.00
Old girder and T rails for melting....	12.00 to 12.50
Heavy melting steel scrap.....	12.00 to 12.50
Relaying rails.....	20.00 to 21.00
Standard hammered iron car axles.....	22.50 to 23.00
Old steel car axles.....	18.00 to 18.50
No. 1 railroad wrought.....	14.00 to 14.50
Wrought iron track scrap.....	12.50 to 13.00
No. 1 yard wrought, long.....	12.50 to 13.00
No. 1 yard wrought, short.....	12.00 to 12.50
Light iron.....	6.00 to 6.50
Cast borings.....	7.00 to 7.50
Wrought turnings.....	8.00 to 8.50
Wrought pipe.....	12.00 to 12.50
Old car wheels.....	12.50 to 13.00
No. 1 heavy cast, broken up.....	12.50 to 13.00
Stove plate.....	9.50 to 10.00
Locomotive grate bars.....	9.50 to 10.00
Malleable cast.....	12.00 to 12.50

**Finished Iron and Steel.**—The demand for structural materials is holding up well and some improvement has been evident in the past week. May was better than the corresponding month of last year, and to all appearances June will be equally good, or better. More inquiries have come out lately in this territory for building work, and the railroads throughout the country seem more disposed than a short while ago to release their held-up inquiries. The plate trade here is quite satisfactory. While the business done is mainly in small lots it aggregates a fair total, and generally brings somewhat above the market price for larger quantities. About 5200 tons of plates will be needed for a boat for the Catskill Day Line, which will probably be built at Newburgh. The steel bar situation remains about the same, and, while the bar iron interests are not receiving their usual business from the railroads, the general business is reported to be coming in in quite satisfactory volume. In New York the important contracts for building steel include the Duncan warehouse, at West and Hubert streets, 1300 tons, taken by the American Bridge Company, and a loft and office building at Sixth avenue and Thirty-first street, 1200 tons; an office building at Madison avenue and Thirty-first street, 500 tons, and a pent house on the roof of the Macy store at Thirty-fourth street and Sixth avenue, 400 tons, taken by Milliken Brothers. Other large matters closed are the following: A freight house for the Missouri, Kansas & Texas Railway at St. Louis, 3000 tons, and car barns for the Denver Tramway Company, 300 tons, taken by the American Bridge Company; two bridges for the Pennsylvania Railroad at Greenville, Pa., 300 tons, awarded Lewis F. Shoemaker & Co.; boiler shops for the Southern Railway at Spencer, S. C., 300 tons, awarded the McClintic-Marshall Construction Company; an extension to the Sim-

mons Mfg. Company's plant at Lockport, N. Y., 900 tons, taken by the Kenwood Bridge Company; a New York Central shed at Oswego, N. Y., 300 tons, awarded the Lackawanna Bridge Company; a building for the Mineral Point Zinc Company, 400 tons, taken by the Milwaukee Bridge Company, and the Clyde Line pier shed at Jacksonville, Fla., 600 tons, awarded the Virginia Bridge Company. The city of Portland, Ore., is reported to be in the market for a bridge to require about 6000 tons. No changes in prices are reported. Plain structural material and plates are quoted at 1.66c.; steel bars at 1.61c., and bar iron at 1.50c. to 1.55c., all New York.

### Iron and Industrial Stocks

NEW YORK, June 15, 1910.

The improvement in the stock market, due to the truce between the Administration and the railroads, has gone further in the past week. Yet there is a disposition to await developments in the industrial and commercial situation. Transactions on the New York Stock Exchange have been on a very moderate scale, and it is noteworthy that Steel common stock constitutes a much smaller percentage of the total sales than was the case when this stock was selling above 85. The range of prices on active iron and industrial stocks from Wednesday of last week to Tuesday of this week was as follows:

Allis-Chalm., com..	8 3/4 - 9	Railway Spr., com.	34 1/2 - 35
Allis-Chalm., pref.....	30	Railway Spr., pref.	151 1/2 - 154
Beth steel, com.....	26	Republic, com.	29 1/2 - 31 1/2
Can. com.....	9 1/2 - 9 3/4	Republic, pref.....	93 1/2 - 95 1/2
Can. pref.....	70 1/2 - 71 1/2	Sloss, com.....	68 1/2
Car & Fdry, com..	53 - 55 1/2	Sloss, pref.....	117 1/2
Car & Fdry, pref.....	115	Pipe, com.....	19 - 20 1/2
Steel Foundries.....	52 1/2 - 53	Pipe, pref.....	70
Colorado Fuel.....	33 1/2 - 35 1/2	U. S. Steel, com..	76 1/2 - 79*
General Electric.....	143 1/2 - 146 1/2	U. S. Steel, pref..	115 - 116 1/2
Gr. N. ore cert.....	58 - 60	Westinghouse Elec.	59 1/2 - 62
Int. Harv., com..	96 1/2 - 98 1/2	Am. Ship, com....	83 - 84
Int. Harv., pref..	121 1/2 - 122	Chl. Pneu. Tool...	39 1/2 - 40
Int. Pump, com..	45 - 46 1/2	Cambria Steel.....	44 1/2 - 46
Int. Pump, pref..	82 1/2 - 83	Lake Sup. Corp.....	22
Locomotive, com..	41 1/2 - 44	Pa. Steel, pref.....	105
Locomotive, pref..	104 1/2 - 105 1/2	Warwick.....	10 - 10 1/2
Nat. En. & St., com.	17 - 18	Crucible St., com..	12 1/2 - 13 1/2
Pressed St., com..	34 - 35	Crucible St., pref..	84 1/2 - 87 1/2
Pressed St., pref.....	95	Harb.-W. Ref., com.	33 - 34

\* Ex dividend.

**Dividends.**—The Sloss-Sheffield Steel & Iron Company has declared the regular quarterly dividend of 1 1/4 per cent. on the preferred stock, payable July 1.

The American Iron & Steel Mfg. Company has declared the regular quarterly dividend of 1 1/4 per cent., and a special dividend of 2 per cent. on both common and preferred stocks, payable July 1.

The American Locomotive Company has declared the regular quarterly dividend of 1 1/4 per cent. on the preferred stock, payable July 21.

The Empire Steel & Iron Company declared a semi-annual dividend of 3 per cent. June 14, payable July 1. Books close June 20.

Phelps, Dodge & Co., Inc., have declared the regular quarterly dividend of \$2.50 a share, payable June 19.

### Labor Notes

By a vote of 34 to 16 the United States Senate June 9 sustained the action of the Committee on Appropriations in striking from the sundry civil bill the House proviso exempting labor organizations from the provisions of the Sherman anti-trust law. This proviso, which was attached to the amendment appropriating \$200,000 for enforcing the anti-trust law specifically declared that no part of the appropriation should be expended in the prosecution of any organization for entering into a combination or agreement having in view the increasing of wages or shortening of hours or bettering the condition of labor or for any act done in furtherance thereof not in itself unlawful.

The union iron molders at Poughkeepsie, N. Y., have asked for an advance to a minimum of \$3.25 a day, to take effect July 1.

A strike of structural iron workers has been called in Buffalo to enforce a demand for a 10 per cent. increase in wages, and it has resulted in a cessation of work by other trades on many structures. The steel workers have asked for an advance from 50 to 60 cents per hour. Contractors are endeavoring to compro-

mise and negotiations to that end are pending. About 200 skilled structural iron workers are affected.

The recent demand of the molders and coremakers in union foundries at Newark, N. J., for an advance to a flat rate of \$3.50 a day has resulted in an adjustment by which each class of labor is advanced 25 cents a day, the molders receiving \$3.50 and the coremakers \$3.25.

At St. Louis the demand made some time ago for an advance for all union molders and coremakers to a flat rate of \$3.50 a day was finally modified by the union to \$3.35 flat. Heretofore floor molders have received \$3.25 and bench molders and coremakers \$3.15. At the Medart Patent Pulley Company's foundry a strike is on, the company insisting on such a scaling of advances as would permit of giving all employees an increase, including those who have heretofore received as much as the new minimum.

The Eastern Steel Company, Pottsville, Pa., has put in operation one of its new 80-ton capacity open hearth furnaces. A second furnace of the same capacity is rapidly approaching completion, and will be put in active service in the near future.



### National Gas & Gasoline Engine Trades Association

The semiannual meeting of the National Gas & Gasoline Engine Trades Association opened on June 13, at the Sinton Hotel, Cincinnati. Registration of members occupied the first day, on which there were no business sessions. In the evening an informal reception was held at the hotel, in which the ladies participated. The Tuesday programme included an opening announcement by President Myer A. Loeb of the Rock Island Battery Company, a formal address of welcome by Vice-Mayor John Galvin, response by C. O. Hamilton of Elyria, Ohio, vice-president of the association, reports of the Entertainment Committee, treasurer and other officers, and reading of several interesting papers, including "Some Association Experiences," by F. J. Alvin, Stockpole Battery Company, Chicago; "The Gas Tractor and the Horse," by L. W. Ellis of the M. Rumely Company, La Porte, Ind.; "Advertising," by W. R. Emery of *Everybody's Magazine*; "Heavy Hitting in the Advertisers' League," by Ren Mulford, Jr., of the Blaine-Thompson Company, Cincinnati, and "The Manufacturer and His Relations with the Technical Journal," by O. Monnett of *Power and the Engineer*, Chicago. The delegates and visitors were taken on the steamer Island Queen for a trip to Coney Island. A banquet was given in the clubhouse, over which Ren Mulford, Jr., an ex-newspaper man, presided.

The programme for Wednesday included papers by G. W. Hall of San Luis Potosi, Mexico, on "The Gas Engine Field in Mexico"; George M. Schebler of Indianapolis on "Carbureters"; Carl Pfanstiehl of the Pfanstiehl Electrical Laboratories, North Chicago, Ill., on "Ignition in Gas and Gasoline Engines"; W. R. C. Smith of the *Southern Engineer*, Atlanta, Ga., on "Present and Future Opportunities in the South for the Gas Engine Builder"; Harry T. Wilson of the Middletown Machine Company, Middletown, Ohio, on "The Relation of Factory Cost to the Gas Engine Sales Department"; L. F. Burger of Fairbanks, Morse & Co., Chicago, on "Gas Producers," and E. J. Fithian of the Bessemer Gas Engine Company, Grove City, Pa., on "Short-Sighted Salesmanship." The delegates were entertained Wednesday evening at the Zoological Gardens, special cars being provided for the trip.

The Thursday programme includes papers by J. D. Lyon of the Westinghouse Machine Company, Pittsburgh, on "Large Gas Engines," illustrated with stereopticon views; H. W. Jones of People's Gas Light & Coke Company, Chicago, on "Some Things We Need in the Gas Engine Business"; Prof. John T. Faig of the University of Cincinnati on "Utilizing Waste Heat from Gas Engine Plants," and H. S. Greene of Nungesser Electric Battery Company, Chicago, on "Dry Batteries." In the afternoon the guests are to be entertained at the plants of several tool manufacturing concerns—among these the American Tool Works Company and the Lodge & Shipley Company.

There were about twice as many exhibitors as had been expected; the large assembly hall at the Sinton was crowded, and this part of the convention was in every respect a huge success.

The Jones & Laughlin Steel Company, Pittsburgh, has placed an order with the Otis Elevator Company for an automatic steam skip hoist engine which will be installed at its Soho furnace in July. The concern has also ordered an automatic steam vertical hoist to be installed at one of its Eliza furnaces, and a hydraulic lift for its new tin plate mill at Aliquippa, Pa. The high efficiency and reliable automatic controller of the Otis steam hoisting engines is claimed to be equal to the Otis electric hoist.

### A New Factory for the Cooper Hewitt Electric Company

The inadequacy of the New York City factory of the Cooper Hewitt Electric Company led to the recent purchase of a building at Grand and Eighth streets, Hoboken, N. J. The new location affords the advantages of good light and air, and railroad and shipping facilities equal to those of the metropolis, as recent rapid transit improvements place the building within 20 min. ride of either the financial or uptown section of New York.

In the new factory will be installed, as rapidly as possible, modern machinery and equipment for manufacturing the Cooper Hewitt lamps. The new alternating current type of the lamp will be the first to be produced in the new plant, and work on it will begin as soon as the requisite machinery can be erected. The building has four stories and a basement, with a total floor space of 60,000 sq. ft. Transversely, it is divided in the center by a 16-in. fire wall, all openings in which are guarded by sliding fire doors with low temperature fuse releases. An elevator gives access to all floors on either side of the fire wall. The entire building is fitted with a combination gravity and pressure sprinkler system. The machinery will be operated by electric motors, with both individual and group drives.

J. K. Dimmick & Co., Land Title Building, Philadelphia, Pa., have sold 10,000 tons of Connellsville coke a month for a period of three years from January 1, 1911, to the Cambria Steel Company, Johnstown, Pa. The coke will be shipped from the plants of Francis Rocks, for whom Dimmick & Co. are sales agents. This transaction is in addition to the recent purchase by the same company of 30,000 tons a month. The Uniontown *News Standard* states that both these transactions were effected "much above the present market and at a fair price for such a length of time, but the price is not made public."

At the annual meeting of the stockholders of the Joseph Dixon Crucible Company, Jersey City, N. J., the old board, consisting of George T. Smith, William Murray, William H. Corbin, Edward L. Young, George E. Long, William H. Bumsted and Harry Dailey, was unanimously re-elected. The board of directors re-elected the former officers, namely: George T. Smith, president; William H. Corbin, vice-president; George E. Long, treasurer; Harry Dailey, secretary; J. H. Schermerhorn, assistant treasurer and assistant secretary. William H. Corbin was also re-elected as counsel.

The Carnegie Steel Company, Pittsburgh, is preparing to put one of its Isabella blast furnaces on low phosphorus pig iron to supply the needs of this grade for subsidiaries of the United States Steel Corporation. In the past, the Steel Corporation at intervals has been a buyer in the open market of low phosphorus iron for the Worcester, Mass., plant of the American Steel & Wire Company and for other subsidiary mills. The electric steel making process now practiced at Worcester, however, has greatly reduced the requirements for this iron.

The Mount Hope Coke Company, Uniontown, Pa., has decided to build 75 additional Mitchell ovens, drawn by the pusher system, at its plant near Lynn station. This company has only been in operation a year, but has run at full capacity ever since it started. It has over 215 acres of Pittsburgh coking coal, which it is developing with probably one of the most thoroughly equipped plants in the coke region.

## Personal

B. C. Shaw, who is in the general machinery and supply business at Kalgoorlie, Western Australia, is in this country to stay four weeks visiting the machinery and supply trades.

S. Watts Bowker has withdrawn from the Central Foundry Company, of which for the past three years he has been general sales manager and a director. He was also secretary, general manager and a director of the Central Radiator Company, and secretary and a director of the Central Iron & Coal Company, subsidiaries of the Central Foundry Company. He takes occasion on his retirement to express his appreciation of the support and kindly personal co-operation extended to him by the trade during his tenure of office. His address will be in care of the Machinery Club, New York City.

William G. Snow, chief engineer of Warren Webster & Co., Camden, N. J., recently delivered a lecture on "Ventilation in Its Relation to Health" before the course in sanitary science and public health at Cornell University.

H. H. Westinghouse has been elected president of Westinghouse, Church, Kerr & Co., Ltd., succeeding the late W. C. Kerr. The corporation is organized under the laws of New Jersey.

George B. Foster has been appointed Chicago sales manager of the Wisconsin Engine Company, Corliss, Wis. His offices will be located in the Fisher Building, Chicago. He will represent the company in the sale of its apparatus in the Chicago District.

Frank H. Crockard, vice-president and general manager of the Tennessee Coal, Iron & Railroad Company, delivered the dedicatory address, May 30, at Comer Hall, the new building of the engineering department of Alabama University, at University, Ala. Dr. Joseph A. Holmes of the United States Geological Survey delivered the address at Smith Hall, the new building of the geological department and museum of the Alabama Geological Survey.

Lucius I. Wightman, for six years advertising manager for the Ingersoll-Rand Company, New York, has tendered his resignation, effective August 1. He will open an office in New York as a specialist in machinery advertising, handling the accounts of manufacturers. Mr. Wightman is a graduate engineer and the author of a text-book on compressed air. Previous to his present engagement he had an experience of some years in mechanical and electrical engineering, construction work and the design, manufacture and selling of machinery.

Charles Munson has resumed his duties as manager of the factory of Charles H. Besly & Co., Beloit, Wis., after an absence of three years on account of his health.

W. O. Duntley, president of the Chicago Pneumatic Tool Company, is in Europe on a business trip. He will attend the International Railway Congress to be held in Switzerland and will return early in August.

R. H. Wolff, New York representative in the United States of the Heroult electric steel furnace, sails for Europe on the Mauretania June 22, to be absent about two months.

Louis C. McKinney has been elected president of the Titusville Iron Company, Titusville, Pa. He has tendered his resignation as superintendent of the South Penn Oil Company, effective July 1.

William L. Austin has been elected president of the Baldwin Locomotive Works, Philadelphia, Pa., succeeding the late John H. Converse. Mr. Austin was one of the vice-presidents of the company, as well as a director, and was a member of the firm of Burnham, Williams & Co. before its incorporation as the Baldwin Locomotive Works. He has been associated with

the concern for many years, for a number of which he has been at the head of the drafting department.

Guy R. Johnson, formerly vice-president and general manager of the Alabama Consolidated Coal & Iron Company, Birmingham, Ala., has been elected president of the Fayette Oil & Gas Company of that city.

George F. McKay, formerly traffic manager of the Lackawanna Steel Company, Buffalo, has been elected president of the firm of Hazard, Mudge & Co., Buffalo, dealers in iron and steel and scrap metals, to succeed E. C. Hazard resigned, to engage in other business.

## American Equipment at the Buenos Ayres Expositions

The machinery and metal working industries of the United States are well represented at the expositions being held at Buenos Ayres in commemoration of the first centennial of Argentine emancipation. There are both a railroad and transportation exhibition and an international agricultural exhibition, which while celebrating the same event are being conducted under different auspices. The first named was opened June 9. The North American section is composed of seven buildings, three of which are 15 x 75 m. each in size, while four are 15 x 50 m. The buildings are steel shedlike structures, and they were erected by the United States Steel Products Export Company. One of the smaller buildings is occupied by the J. G. Brill Company, which is exhibiting its cars, and by the Niles-Bement-Pond Company and the Pratt & Whitney Company which are showing their line of machine tools particularly adapted for railroad repair work. A second building is occupied by Haywood Brothers & Wakefield, the Galena Oil Company, Garr, Scott & Co., Otis Elevator Company, W. S. Tyler & Co., W. F. Goodrich, the General Electric Company, Fairbanks-Morse Company, Page Woven Wire Company, Link-Belt Company, Kilborn-Jacobs Mfg. Company, Duff Mfg. Company, Globe Wernicke Company, Gillette Sales Company and the Ajax Forge Company. Another of the smaller buildings is occupied entirely by the United States Steel Products Export Company, which is showing wire and other steel products used in connection with railroad work. The Fairbanks Company occupies half of one of the larger buildings, and in the same structure the American Car & Foundry Company has an exhibit, as have the Berger Mfg. Company and the E. I. Du Pont de Nemours Powder Company. Other exhibitors are the International American Industries Company, McConway & Torley Company, Standard Coupler Company, R. W. Hunt & Co., Schutte & Koerting Company, Herring-Hall-Marvin Safe Company, Cowdrey & Co., American Locomotive Company, Standard Steel Car Company, Baldwin Locomotive Works, Pennsylvania Steel Company and the Standard Steel Works. The exposition will continue until November 25.

The Rural Society of Argentine is conducting the agricultural exhibition, which will last until July 31. A large number of American manufacturers of agricultural machinery are also showing their products.

**Railroad Equipment Orders.**—No orders for cars are reported placed by Western railroads during the past week. The Baltimore & Ohio has ordered 1000 cars at Pittsburgh from the Standard Steel Car Company and is inquiring for 5000 more. The Hawley Railroads have inquired for 5000 cars and it is understood that these lines, including the Missouri, Kansas & Texas Railway, will order 8000 cars. The Chicago, Burlington & Quincy has bought '65 locomotives. The Northern Pacific inquired recently for 1000 refrigerator cars, but the inquiry has since been recalled or suspended.



## The Machinery Markets

The machinery trade in most parts of the country is steady and there is a healthy demand for a general line of machinery in all markets. In the metropolitan district the trade is still bidding on an extensive list recently issued by the Delaware, Lackawanna & Western Railroad, and there are reports that supplementary lists will be out soon. In New England the shoe machinery business is a topic of general discussion. The Wonder Worker Shoe Machinery Company, an organization headed by Thomas S. Plant of Jamaica Plain, Mass., has announced that it will bring out a full line of equipment for the manufacture of shoes, and there are tentative inquiries out for a large list of machine tools. Announcement of a profit sharing plan by the United Shoe Machinery Corporation, Beverly, Mass., is taken to indicate a resolution to meet the new competition. In Chicago there is a better feeling in the machinery trade and the ill effect of the railroad rate discussion is wearing off. In the Southwest there is a good call for mining machinery, and Detroit has experienced a good business in foundry equipment, as many who attended the recent foundrymen's convention have placed some good sized orders. There is a marked activity in the steam specialty business in Pittsburgh and some good orders are coming from the oil fields for drilling apparatus and the like. A rush of building business is bringing out a good trade in the Northwest in pneumatic tools, fabricating machinery and some power equipment, especially in the electrical line. During the week there has been liberal buying in Milwaukee and orders amounting to \$1,500,000 have recently been placed with Western gas engine builders. There is a noticeable improvement in inquiries in Cleveland and the business done there is largely in the line of power and foundry equipment. An unusually large business is expected in the Central West from municipal pumping plants, as there is much of that work in contemplation. The export business continues especially good.

### New York

NEW YORK, June 15, 1910.

A good volume of business is being done in the New York market, but it does not appear that the total for this month will equal that of May unless some railroad requirements on which the trade is now bidding are closed out. The Delaware, Lackawanna & Western Railroad is not yet buying against the large list issued the latter part of last month, but it is declared by the engineers in charge that orders will be placed shortly. It is said in the trade that some supplementary lists are being prepared covering requirements not called for in the original lists. Inquiries from the general manufacturing field are not as large as they were a few weeks ago, but considering the time of the year this should be expected. An unusually good business is being done in electric motors and other small power equipment as the result of renewed activity in the building trades. Electric motor manufacturers are also getting some good business from plants where direct current drives are being installed. The export trade continues good and there are inquiries for sugar making equipment from Cuba and the British East Indies. On the whole the export demand is encouraging and there are some excellent inquiries in the market from foreign users of machine tools. The demand for second-hand machinery has fallen off slightly, but not enough to affect values and there are some lines of machine tools that are in such great demand that those inquiring for them are willing to pay very close to the list price of new equipment, provided they can get immediate deliveries.

The Abendroth & Root Mfg. Company, Newburgh, N. Y., is installing large hydraulic riveters with an accumulator and high pressure pumps and an Ingersoll-Rand air compressor. This equipment will be used for increasing the manufacture of the Root water tube boilers and the Root spiral riveted pipe.

The Trebert Gas Engine Company, formerly of Rochester, N. Y., is now occupying a plant at Butler, Ind., which it recently purchased from the receiver for a company which was in bankruptcy proceedings. The Trebert Company has brought out a new 4½ in. x 5 in. four and six cylinder motor for automobile use and later on it will increase its manufacturing capacity.

The Texas Sugar Refining Company has been incorporated under the laws of Delaware with a capital stock of \$1,600,000. It has engaged the Eastwick Engineering Company, Ltd., 82 Beaver street, New York, to prepare plans for a strictly modern sugar refinery of several hundred tons daily capacity, which is to be erected at Texas City, Texas. Capt. A. B. Wolvin, of Duluth, Minn., who is at the head of the Texas City Steamship Company, is understood to be interested in the project. The building plans will not be completed for several weeks and no machinery lists have as yet been made up.

The Augustine Automatic Rotary Engine Company, Buf-

falo, N. Y., manufacturer of rotary engines, is having plans prepared for enlarging its present plant in a general way. Some of the machinery which will be installed will be special and will be made by the company. In addition to this equipment, lathes, drill presses, milling machines and other machine tools will be required.

The Field Force Pump Company, Elmira, N. Y., manufacturer of spraying pumps, spraying machines and force pumps, is erecting a two-story and basement building 75 x 110 ft., to be used as a woodworking, painting and shipping department. The company will install electric motors, generators and perhaps two or three woodworking machines.

The L. J. Wing Mfg. Company, 90 West street, New York, has sold 28 20-in. "typhoon" turbine blowers for forced draft on 3500 hp. of boilers to the Delaware, Lackawanna & Western Railroad for its Bliss & Auchincloss collieries at Nanticoke, Pa.

John L. Fitzgerald, Albany, N. Y., has purchased a foundry on Pleasant street, that city, formerly owned by Haight & Clark. The plant will be converted into a first-class foundry for brass work and will be put in commission as soon as possible.

The Tucker Feeder Company, J. V. Leitch, secretary, 1 Madison avenue, New York, wishes to make a contract for a quantity of screw machine work and a lot of gears for which it has blue prints prepared that will be sent to interested companies.

The Brown, Lipe & Chapin Company, Syracuse, N. Y., manufacturer of differential gears for automobiles, &c., will add to its plant a one-story concrete building 20 ft. long, to be used for annealing and case hardening.

The Conant-Bryant Power Company, Wilson, Niagara County, N. Y., has been authorized by the Public Service Commission to issue stock to the amount of \$25,000, to be used for the construction of a power house and the installation of an electric power plant.

The Lundhaven Brass Foundry Company, recently incorporated at Buffalo, N. Y., is fitting up a brass foundry and machine shop at 41-45 Letchworth street, that city, for the manufacture of high grade manganese bronze castings for the automobile and motor boat trade and miscellaneous work. A brick building 60 x 120 ft. has been secured, and an annex for a furnace room is being added which will contain 14 furnaces, and about 50 molders will be employed. Some machinery in the way of lathes, drills and motor equipment will be required. Frank P. Lund, formerly superintendent of the Lunen Bearing Company, Buffalo, is vice-president and manager of the new company.

The Maple Leaf Milling Company of Winnipeg, Man., will erect a grain elevator and flour mill at Port Colborne, Ont., at the entrance to the Welland Canal. The elevator capacity will be 1,000,000 bushels and that of the mill 6000 barrels.

The Cattaraugus Cutlery Company, Little Valley, N. Y., is adding to its electrical equipment.

An 8-in. motor driven centrifugal pump will be installed by the Tomkins Cove Stone Company, Tomkins Cove, N. Y. The authorities at Spencerport, N. Y., will take bids

## THE MACHINERY MARKETS

until June 21 on a complete water works system, including steel tank of 100,000 gal. capacity and two pumping units of moderate capacity.

Two large barge canal contracts which will call for the use of outdoor equipment, such as dredging apparatus, conveying machinery, hoisting engines, &c., have been awarded by F. C. Stevens, Superintendent of Public Works of the State of New York. The contracts are No. 63, which was awarded to H. S. Kerbaugh, Inc., Philadelphia, Pa., for \$1,990,043, and barge canal contract No. 73, to E. H. Graves, Cleveland, Ohio, for \$767,467. Contract No. 63 provides for the improvement of 12 miles of the Erie Canal in Monroe County, and the second contract calls for the dredging of a channel in the Hudson River and other incidental work between Northumberland and Stillwater, and covers 15 miles of dredging and excavating.

Naylor & Co., 41 Wall street, New York, are looking for a location in Brooklyn to establish a plant to manufacture by-products from furnace refuse.

The Balbach Smelting & Refining Company, Newark, N. J., is building on Newark Bay an addition to an existing smelting plant which is to be 64½ x 86 ft. The building will cost about \$6000.

The National Corundum Company has been incorporated at Buffalo with a capital of \$100,000, to manufacture abrasive wheels and machinery and will take over the property and continue the business of the former company of the same name. New kilns and equipment will be added to the factory at Main street and the Erie Railroad. The incorporators are W. H. Farnsworth, C. W. Zimmer and L. H. Knapp, 2990 Main street.

The Melographic Roll Company, Buffalo, recently incorporated, to manufacture automatic piano players, &c., will erect and equip a seven-story factory, 51 x 160 ft., at Jewett avenue and the New York Central Railroad. Jacob Hoyl is president.

The Rome Electrical Company, Rome, N. Y., will build an insulated wire plant to comprise a brick and steel fire-proof factory, 80 x 120 ft., one story, and a power house, 32 x 42 ft. Geo. A. Clyde, 132 Front street, is general manager.

### Catalogues Wanted

Leon Gaucet, 148 Rue Stephanie, Brussels (Laeken), Belgium, wants illustrated catalogues and dealers' discounts on American machinery.

### Chicago

CHICAGO, ILL., June 14, 1910.

The Chicago machinery market continues relatively quiet, but there is a fair amount of inquiry and some business is being done. It is generally expected, however, that the Chicago market will be quiet during the summer. A storm in the financial world like the controversy between the railroads and the Government over freight rates takes a long time to wear off. The failure of the railroads to obtain the increased revenues which they expected has had a depressing effect on all the manufacturers of railroad equipment, who represent an important branch of the machine tool market, and it has also dampened the enthusiasm of manufacturers in other industries who have contemplated improvements or additions to their equipment. However, general business conditions in the West continue good and will undoubtedly result in an increased volume of inquiry for machinery this fall.

One of the interesting phases of the machinery market is the progress in mechanical equipment for foundries. Chicago foundrymen who visited the Detroit convention last week have returned with new ideas regarding labor saving devices. Molding machines have been steadily broadening their field of usefulness until they are now found in a variety of designs which covers nearly all the work of the modern foundry and the manufacturers have eliminated most of the trouble that made foundrymen cautious a few years ago about installing machines.

The Imperial Brass & Mfg. Company, Chicago, has purchased property at Center avenue and Harrison street, 100 x 125 ft., and is preparing plans for a manufacturing plant to be erected at an estimated cost of \$150,000.

The Consolidated Indiana Coal Company, Hymers, Ind., will remove its machine shop in the near future from Star City to Hymers, where it is erecting a steel building 40 x 100 ft. It will be operated by a steam plant and will be equipped with lathes, planers, shapers, drill presses, pipe cutters, &c.

The car barns and shops of the Des Moines City Railway Company, Des Moines, Iowa, which were destroyed by fire May 26, will be rebuilt. The new building, however, will be of ordinary construction, as the company contemplates the erection of a larger building in the near future of concrete construction at a more desirable location.

The Associated Foundry Mfg. Company, Waterloo, Iowa, has filed articles of incorporation with a capital stock of \$50,000. The nature of the business to be conducted by the company is the manufacture of gray iron castings and gasoline engines. J. G. Phelps is president.

The Motor Machine Company, Terre Haute, Ind., recently incorporated, has taken over the shop and business formerly conducted by Michael Henry of that city. The company expects in the near future to move into larger quarters and install \$5000 worth of new equipment.

The Waterloo Gasoline Engine Company, Waterloo, Iowa, is erecting an addition to its foundry which will give it about 20,000 sq. ft. of floor space. It will be ready for occupancy in about 60 days.

The Iroquois Iron Company, Chicago, has commenced filling in the old slip, included in its lake shore tract just east of the Calumet River, and is receiving bids for the construction of two modern furnaces, plans for which have been in the course of preparation for some time.

The Merchants Heat & Light Company, Indianapolis, Ind., will add to its electric generating system an alternating current dynamo of 3000 kw. driven by a cross compound Corliss engine.

The Streater Motor Car Company, Streater, Ill., has two machine shops, each 75 x 400 ft., in course of erection. The necessary tools and other equipment have been ordered.

A new machine shop, of brick and steel construction, is to be added to the repair plant of the Chicago & Northwestern Railway at West Fortieth street, Chicago.

The Gardner Governor Company, Quincy, Ill., is putting out a type of high speed air compressor which possesses features of considerable advantage for installation in places where but little care can be given such a machine. It is compact, light, self-oiling and may be driven in any manner desired.

The Crawfordsville Electric Light & Power Company, Crawfordsville, Ind., will erect a generating station of considerable size.

The Union Malleable Iron Company, East Moline, Ill., which originated the Heald type of chain, finds present sales conditions favorable, with prospect of further improvement.

A record recently made by one of the hoists built at the works of the Danville Foundry & Machine Co., Danville, Ill., is 3102 tons of ore in eight hours.

The Kelly Foundry Company has been incorporated at Elkhart, Ind., with \$40,000 capital stock, to do a general foundry and machine business. The directors are Edward Kelly, Sr., Edward C. Borneman, George O. Borneman, Herman Bowerman and A. R. Beardsley.

The Seymour Public Service Company has been organized at Seymour, Ind., and incorporated, with \$100,000 capital stock, to supply electric light, heat and power. The directors are T. C. McReynolds, W. W. Layton, C. E. Layton, C. W. McReynolds.

The Board of Education, Princeton, Ind., will receive bids June 20 for the installation of a heating and ventilating plant. Elmer E. Reeves is secretary.

The Universal Motor Company, Denver, Colo., will move to Newcastle, Ind., and has purchased the buildings and property of the Safety Shredder Company and will use them in addition to others to be built. The company will manufacture motor trucks.

The Evansville Public Service Company which proposes to build an electric light and power plant at Evansville, Ind., has increased its capital stock from \$250,000 to \$1,000,000.

The People's Light and Heat Company, Indianapolis, Ind., will increase its boiler capacity from 1850 to 2500 hp., install a large centrifugal pump, and the plant will be equipped with smoke-consuming devices and automatic ash and coal conveyors. George M. Brill, consulting engineer, Chicago, is preparing the plans for the improvements. John F. Wild, Indianapolis, is president of the company.

The plant of the Kokomo Brass Company, Kokomo, Ind., was damaged by fire June 7 to the extent of \$20,000. The loss was covered by insurance and the plant will be rebuilt.

The Peters Novelty Company has been incorporated at Fort Wayne, Ind., with \$10,000 capital stock, to manufacture novelties. The directors are Frank E. Peters, Fred H. Jones and George B. Somers.

The Matheny Grease Cup Company has been organized at Terre Haute, Ind., and incorporated with \$25,000 to manufacture grease cups. The directors are James G. Matheny, E. E. Stein, John J. Lynch, Henry W. Clute, Charles W. Scott, William D. Davis and Henry Sachs.

The Equitable Powder Mfg. Company, East Alton, Ill., which is making an addition to its Fort Smith, Ark., plant, is in the market for three sets of powder keg making machinery.

The Western Canada Flour Mills Company, Chicago, has let contract to the James Stewart Company, Chicago, for the construction of a grain handling plant at Goderich, Ont., to cost \$175,000.



## THE MACHINERY MARKETS

### Philadelphia

PHILADELPHIA, Pa., June 14, 1910.

The demand continues irregular. Very few lists of any importance have recently come before the trade, although prospects for several programmes of fair size are in sight. During the week the demand has been confined principally to business of a day to day character, in which single tool sales represent the bulk of the transactions. New business from the railroads is quiet. Some buying of rolling stock and motive power is, however, to be noted, the local locomotive builder booking one substantial as well as several small orders. Reports are general that business under consideration develops very slowly. In some instances the approaching conventions of the Master Mechanics and Master Car Builders during this and next week at Atlantic City, N. J., in connection with which there is usually an elaborate display of tools, is given as the cause of temporary delay, prospective buyers waiting to see what new equipment, which may prove of advantage for their requirements, will be offered. A number of tool builders in this vicinity will make exhibits, while the trade generally will give considerable attention to the conventions and exhibition. As a rule, makers of machinery and machine tools continue actively engaged, orders on hand keep plants operating on full time, but there is a general expression that the demand is not as aggressive as it was. Deliveries in many cases are easier, and sharper competition is to be noted for business offered.

In the second-hand field there is less urgency in the demand, although in some lines a fair volume of business continues to be reported. For moderate size power equipment, the demand continues fairly good.

The Fairbanks Company, Seventh and Arch streets, is sending invitations to users of machine tools in this district requesting the attendance of a mechanical representative at a demonstration of high speed lathes, rapid action planers and high duty shapers, to take place on their machinery display floors during the week beginning June 20, from 10 a.m. to 4 p.m. daily. Up to date methods of accomplishing increased production will be shown, the demonstration being in the nature of actual work performed by practical mechanics.

The Chester Engineering & Machine Company, Chester, Pa., has recently made considerable additions to its machine tool equipment and has further purchases under consideration. A new test house for gas engines will shortly be erected. This concern makes a specialty of four-cylinder four-cycle automobile engines of 20 to 30 hp., and has recently booked an order for 100 four-cycle four-cylinder, water cooled air plane motors for an American air plane builder.

The group of buildings, including a machine shop, power house and office building, to be erected at Fifty-sixth street and Lancaster avenue, mentioned last week, is understood to be for the Standard Gas & Electric Power Company. S. S. Eveland is president, Land Title Building.

The Tindel-Morris Company, Eddystone, Pa., notes a moderate demand for its line of special lathes. The forging department is particularly busy on a varied class of work and is operating overtime in order to meet the demand. This company will shortly make an addition to its machine shop, the equipment required will, however, be special tools of its own manufacture. The Tindel-Morris Company has recently shipped a Tindel Albrecht crank shaft lathe to the Packard Motor Car Company, Detroit, Mich., and a Tindel Albrecht crank shaft grinder to the Brightwood Motor Mfg. Company, Springfield, Mass. A special machine for automobile axle work is being built for the American Locomotive Company, while a double journal crank shaft lathe has been furnished the Erie Forge Company, Erie, Pa. Quite a good demand for Tindel high duty saw blades is reported.

A number of builders in this city are estimating on a gas engine power house, one-story, 32 x 101 ft., and a one-story forge shop, 52 x 102 ft., for the Bethlehem Steel Company, Bethlehem, Pa.

The Empire Grate Company, Chester, Pa., which moved its plant some months ago from Sixth street to Ninth street, above Morton avenue, in that city, notes an exceptionally good demand for its Empire boiler grates, as well as other gray iron castings.

The Reading Steel Casting Company, Reading, Pa., which has under construction a steel casting plant at Bayonne, N. J., advises that it is rapidly nearing completion and that all the equipment now deemed necessary has been contracted for.

The Newmanstown Electric Light Company, Newmanstown, Pa., will extend its system so as to serve Sheridan and Schaefferstown, Pa., with electric power. Property for a power house has been purchased and work is about to be started. Orders for a 90-kw. three-phase 2200-volt gen-

erator, an Erie City four-valve 150-hp. engine and an Erie tubular boiler have already been placed. D. S. Martin, Bellevue, Pa., is the electrical contractor.

The Belmont Iron Works, Eddystone, Pa., has begun work on the erection of a building to be used as a power house.

Henry Disston & Sons, Inc., are preparing to make further additions to their plant in Tacony. Foundations are now being laid for a two-story structure 43 x 180 ft., as an addition to its file making department. Work will also be started at an early date on an L-shaped building 180 x 290 ft., to accommodate the machine, knife and jobbing departments. Plans are also under way for a large two-story fireproof building for the cold rolling department. Considerable new machinery is to be installed in its various new departments, a large share of which is of its own design and manufacture.

The Electric Service Supplies Company is taking estimates for the erection of a six-story concrete manufacturing building, 66 x 121 ft., to be built at Seventeenth and Cambria streets. Very little equipment will be required for the new plant, as that from the company's present plant at Keokuk, Iowa, will be moved to the new plant on its completion.

The Baldwin Locomotive Works has received an order for 85 passenger locomotives for the Harriman system. A number of miscellaneous orders have also been recently booked. The outlook for further business is considered favorable; the plant is now quite busy, with a total of 14,500 men employed, and orders in hand are sufficient to keep this force employed for the greater part of the present year.

### Cincinnati

CINCINNATI, OHIO, June 14, 1910.

Whatever effect the recent flurry over Governmental rulings in connection with the railroads may have had, there is certainly no diminution of activity among tool manufacturers and those of kindred lines here who had in contemplation enlargements and improvements or material changes in location.

A number of deals pending a week ago are now either consummated or in a fair way to be. One of the largest is the transfer of the Cincinnati-Bickford factory in the Camp Washington tool district to the Hogan Shoe Company and through that concern to the D. T. Williams Valve Company. A few weeks ago the Hogan Shoe Company, of 2727 Spring Grove avenue, entered into negotiations for the purchase of the Cincinnati-Bickford plant, expecting to use the building for its own purposes. The amount involved was about \$50,000. The Cincinnati-Bickford Company, as is rather well known, is a member of the manufacturing colony which is building up the new district in Oakley. The company's new home in that suburb is expected to be ready for occupancy by December 1. The Spring Grove avenue plant into which the D. T. Williams Valve Company will move when the Cincinnati-Bickford people vacate is a four-story and basement structure on lot 150 x 198 ft. with about 40,000 sq. ft. of floor space. The Williams Company will be able to about double its capacity in its new home, and will be in the market soon for considerable equipment. It acquires a perfect power plant complete, and contemplates the erection of a foundry 60 or 80 x 150 ft. on the Jessamine street side of the building. The present plant of the D. T. Williams Company on Hunt street adjoins a lot 50 x 270 ft., also the property of the company, and this was sold to the Eagle White Lead Company for \$25,000. The Williams Company increased its capitalization about a month ago to take care of enlargements and improvements.

The Industrial Bureau of Cincinnati has been showing R. M. Bowen, Dallas, Texas, about the city and furnishing requested figures and statistics with a view to securing for Cincinnati the establishment of the new plant of a company which will manufacture machines for handling stenographic dictation. The company is well capitalized, it is reported, and asks nothing but superior location and shipping facilities.

The Executive and Entertainment Committees of the Cincinnati Metal Trades Association met at the Blue Grass Inn in the Kentucky Highlands on Tuesday evening to arrange the details of the members' summer outing at the Laughery Club, which will also be the regular quarterly meeting, and to take preliminary steps for the summer outing to employees of the members. August Tuechter, of the Cincinnati-Bickford Tool Company, presided over the combined committees.

The Manufacturers' Club of Cincinnati is expected to entertain some well known men in the iron and steel trades at the next meeting of the organization. Among these are Charles M. Schwab, president of the Bethlehem Steel Company and W. H. Bope, vice-president of the Carnegie Steel Company, both of whom have accepted and will deliver addresses.

## THE MACHINERY MARKETS

The Incandescent Light & Stove Company, at present located on Pearl street, Cincinnati, is expected to decide definitely on the character and extent of its new plant to be built in Norwood or the Oakley manufacturing colony district at a directors' meeting or mail conference some time in the near future. The new plant is expected to cost approximately \$80,000, exclusive of the land. An option was secured on about 4 acres in the Oakley district, and it has also other locations in view, notably Norwood. The company manufactures gas machines for individual use.

At the annual meeting of the directors of the Barney & Smith Car Company in Dayton, Ohio, June 7, old directors were re-elected as follows: Walter St. John Jones, W. H. Doane, Vachel W. Anderson and Joseph W. Rawson of Cincinnati, E. J. Barney, E. F. Platt, A. M. Kittredge, H. M. Estabrook and A. J. Stevens of Dayton. Mr. Stevens, who has been the purchasing agent, was elected director and second vice-president to succeed Hugh M. Wilson, resigned. The old officers re-elected were A. M. Kittredge, president; H. M. Estabrook, vice-president and general manager; J. Frank Kiefaber, secretary and treasurer. It was reported that the company has orders on its books for \$7,000,000 worth of cars, sufficient to keep the plant in operation at its present capacity for about a year. It was also reported that there had been no cancellation of orders so far.

The strike existing at the plant of the National Malleable Castings Company's plant in Toledo, Ohio, for several days was terminated June 9 when some 1500 men returned to work under the same conditions as prevailed when they left. It is reported that they were receiving 18 cents an hour and struck for 20.

The Marion Dump Wagon Company, Marion, Ohio, has been incorporated by Herbert S. Long, Jay Smiley, George B. Christian, Charles C. Fisher and William T. Jones. Capital stock, \$10,000.

The Miami Tool Supply Company has been incorporated at Dayton, Ohio, to deal in tools, by Charles E. Pease, W. L. Hitchcock, O. I. Robbins, Robert W. Brumbaugh and Jacob B. Eckert. Capital, \$10,000.

The Chickasaw Mfg. Company, Chickasaw, Ohio, has been granted authority to change its name to the Excelsior Company.

M. C. McDougal of the Paragon Mfg. Company of Fort Wayne, Ind., entertained the company's employees at dinner in honor of the removal into the new factory in the Evans Building on East Berry street last week.

The Memphis Iron & Steel Company is the name of a new incorporation at New Albany, Ind., to deal in old material. The capital stock is \$10,000 and the incorporators are Rachel, Lena, Sallie and Julius Joseph.

Surveys and other preliminary work looking to the building of the Vulcan Steel Shovel Company's new plant at Evansville, Ind., have commenced. The company has 5 acres bordering on the river. Active construction work is to be commenced by midsummer, according to present plans.

The Toledo Molyneux Company of Toledo, Ohio, recently incorporated, with a capital of \$100,000, to handle the product of the Buffalo Molyneux Company, which manufactures a new mailing machine, will be under the general superintendency, it is stated, of J. F. Angell, formerly general superintendent of the Toledo & Ohio Central and the Zanesville & Western Railroads, with headquarters in Columbus, Ohio. The general manager of the Toledo company will be T. T. Whittelsey, formerly a railroad man. It is announced that another organization for central Ohio is contemplated.

Work is expected to commence before the close of June on the new brick building to be erected in Norton, Va., by the Norton Car & Foundry Company, which recently increased its capital stock from \$15,000 to \$40,000. A meeting was held June 14 to decide on further plans. It is expected at this time that C. S. Bateman of Bristol, Va., who has subscribed to a large block of the stock, will be made general manager. The new building will be erected on the site of the present plant.

The Standard Pulley Company, Powers street, Cummins-ville, is having a good run of orders from two or three local tool manufacturing concerns, the greatest in its history. These companies make specialties of milling machines, planers, shapers and lathes.

The Lucas Pump Company, Dayton, Ohio, has increased its capital stock from \$30,000 to \$50,000, for the purpose of enlarging its plant. C. O. Lucas is president and E. M. Heathman secretary of the company.

### Cleveland

CLEVELAND, OHIO, June 14, 1910.

Machinery houses generally report only a small volume of orders during the past week. Sales were nearly all in single tools or very small lots, which in the aggregate did not show a very active demand. Inquiries, however, indicate an im-

provement during the past few days. No large lists have come out, but there is a better volume of inquiry for lots of half a dozen tools and under. These are mostly from smaller manufacturing plants that are planning additions to their equipment. The demand for bolt and nut machinery continues quite active. Several orders have come during the week from plants that are adding to their capacity. A better inquiry is coming from the automobile trade, and this is taken as an indication that the automobile builders are about to start buying the additional machinery equipment they will require for getting out their next season's machines.

The majority of new companies that are being formed in metal working lines in this territory at present are being organized to manufacture some automobile part or accessory. Plants of this character usually start in a small way and their machine tool requirements are not large, being limited to a few small tools. A good demand is noted for special machinery used in the manufacture of sheet metal products.

In power equipment the demand for motors and generators in medium and small sizes is holding up well, but inquiries for large installations are scarce.

In the foundry trade conditions continue quite satisfactory. Local light gray iron foundries are comfortably well filled with work.

The Standard Welding Company, Cleveland, has completed plans for the erection of a large addition to its plant, the general contract for which has been let to the Crowell & Sherman Company of this city. A four-story reinforced concrete building will be erected, 350 ft. long, and providing 85,000 additional square feet of floor space. This will be used for extensions to the company's tube and rim departments, and will provide an increase in the present capacity of the plant of about 50 per cent. The company will spend about \$75,000 for machinery equipment, of which about \$10,000 will be for machine tools, including lathes, drill presses, boring mills and shapers. The remainder will be for motors, elevators and special forming and shaping machinery for tubes and special machinery for rims. The company will place contracts for a portion of the special machinery. The remainder it will make itself.

The Hale Motor & Machine Company is the name of a new concern that has been organized in Detroit by S. E. Hale, Cleveland manager of Hill, Clarke & Co., and others. The company will be capitalized at \$125,000. Its products will be motors, transmissions and other automobile accessories. Negotiations are now under way for a site, on which the erection of a plant will be started as soon as the contracts can be let. The plant will be 76 x 200 ft., two stories high. The machinery equipment required will amount to about \$30,000 to \$40,000, the most of which has been purchased. The necessary power equipment has not yet been bought. S. E. Hale will be president and general manager of the company, and Charles Ritter of the Ritter Mfg. Company, Detroit, will be secretary and treasurer.

The Canton Foundry & Machine Company, Canton, Ohio, reports that it has recently received orders for equipment of several new metal ceiling and metal shingle plants. Among the purchasers of considerable new equipment is the New Orleans Roofing & Metal Works, which will increase the output of both its New Orleans and Mobile plants. The British Columbia Roofing & Ceiling Company, Vancouver, B. C., is a new concern for which the Canton Company has furnished the plant equipment for the manufacture of conductor pipe and eave trough. The Canton Company recently received an order for conductor pipe from New Zealand.

The Kennard Power Block, West Third street, Cleveland, was destroyed by fire June 11, the loss resulting amounting to about \$100,000. The building was occupied by six manufacturing plants, whose equipment was practically a total loss. The occupants were the Cleveland Steel Tool Company, Peerless Automatic Machinery Company, Wire Goods Mfg. Company, American Plating Works, Fraser Mfg. Company and the Adams Wheel Mfg. Company. The Cleveland Steel Tool Company has opened a temporary office at 304 Lakeside avenue, which it will occupy until its new factory building, now under construction on East Eighty-second street, is completed.

The Kinsey Mfg. Company, Toledo, Ohio, has commenced the erection of a large plant for the manufacture of steel automobile frames, hoods, fenders, mufflers, tanks and other automobile parts. The plant will be near the Overland automobile plant on Central avenue. The building will be 105 x 286 ft., three stories, and will have an L annex 65 x 75 ft., three stories and a basement. The plans also include the erection of a brass foundry.

The Alton Motor Accessory Company, Akron, Ohio, has been incorporated, with a capital stock of \$50,000, to manufacture an automobile oil filtering device and heaters for automobiles. The company has erected a building for manufacturing purposes at South and High streets. The officers of the company will be H. F. Maranville, president and



## THE MACHINERY MARKETS

superintendent; C. H. Maranville, associate president and secretary; Harry Williams, treasurer, and Clyde S. Pelton, vice-president and general sales manager.

The Ohio Farmers' Hay Tool Company, Canton, Ohio, has been incorporated, with a capital stock of \$25,000, to manufacture haying tools. Samuel P. Lersch and others are the incorporators.

The Adams Brothers Company, Findlay, Ohio, maker of motor trucks, &c., will increase the capacity of its plant by the addition of new machinery, including lathes, milling machines, grinders, &c.

The Cleveland Chain & Mfg. Company will enlarge its plant by the erection of a two-story addition 50 x 150 ft., of brick and steel construction, and with basement. The only machinery required will be special machinery, which the company will make in its own plant.

An industrial exhibit of made-in-Columbus products will be held at the Ohio State Fair grounds, Columbus, Ohio, June 21 to July 4, under the auspices of the Chamber of Commerce of that city. Enough exhibits have already been promised to assure the success of the undertaking.

The "Greater Canton" campaign conducted recently in Canton, Ohio, to raise a fund to secure new manufacturing plants in that city proved fully as successful as the hustling business men back of the project had hoped for. From cash donations and the sale of lots a fund of \$160,000 was raised, fully one-half of which will be available for the offering of inducements to manufacturing plants to locate in that city.

The plant of the Ames Bending Company, Celina, Ohio, which was recently destroyed by fire, will be rebuilt at once. The power plant equipment has been purchased, but the company is in the market for two rip saw tables, two cut-off saws and a complete sawmill.

### New England

BOSTON, MASS., June 14, 1910.

The percentage of falling off of business in the machine tool trade during the first half of June, as compared to May, is not far from the experience of previous years, good and bad. With some houses orders are proportionately larger than usual, in their relation to the earlier months of the year. It is no infrequent comment that the expressed slightly depressing experience of customers in the present market is not borne out by their own purchases. The supply trade is notably good. Some dealers have done a three months' business constituting the best quarter in their history. The summer will not equal the spring, unless an industrial anomaly is created, but the common expectation is that there will be a very fair amount of business, probably amounting to the normal of the hot weather.

The trade is deeply interested in the developing status of the shoe machinery industry which centers in this territory. For several years the effort has been making to create a shoe manufacturing equipment that would compete with that of the United Shoe Machinery Company, Beverly, Mass., which has had control of the field. Several independent concerns have been established for the purpose, but elimination and consolidation have concentrated the outsiders into the Wonder Worker Shoe Machinery Company, of which Thomas G. Plant, owner of a great shoe business at Jamaica Plain, Mass., is the head. Large sums have been expended during the preliminary stages of the venture. Great numbers of inventions have been acquired, as the records of the Patent Office show. The Bresnahan Shoe Machinery Company, Lynn, Mass., has been the center of operations. Its manufacturing equipment has been greatly increased from time to time, the industry having been an important customer for several years, including the depression. Outside plants have been employed in the work; the Fitchburg Machine Works and the C. H. Cowdry Machine Company, Fitchburg, Mass., are now producing for the enterprise. Inquiries have just been made in the trade, foretelling the purchase of a long list of machine tools for manufacturing purposes, and it is understood that the new shoe manufacturing equipment will be produced on a commercial scale in the near future, though details of these plans are not now available. The United Shoe Machinery Company is a large factor in the machinery market, its purchases amounting to imposing totals during the year. Its works are among the finest in the country, being equipped throughout with the best of machinery.

The latter corporation has just announced a novel profit sharing plan for the benefit of the lessees of its machinery, none of which is marketed excepting under lease on a royalty basis. A certain percentage of the income from leases, together with the earnings of the fund, will be set aside for the purchase of common stock of the company. These shares will be distributed at the expiration of a term of years to those who are consistently loyal to the terms of their leases.

This latest action of the big company adds to the interest in the development of the shoe machinery situation.

The Hyde Park Steel Casting Company, Hyde Park, Mass., has been organized to take over the steel foundry in that town operated recently by the New England Steel Casting Company. The new company is manufacturing crucible steel castings. Samuel Coleman is the president and W. M. Murray the treasurer.

Announcement is made that the Griffin Wheel Company has acquired a large tract of land adjacent to its foundry property, Chelsea, Mass., in the Boston suburbs, and the purchase is looked to mean the ultimate important extension of the works. The land is a part of a large area, the bulk of which passes to the Boston & Maine Railroad for the extension of its freight yards.

The Foster Machine Company, Westfield, Mass., manufacturer of special textile machinery, is erecting a two-story addition to its shops and will establish a new power plant.

The Blake & Johnson Company, Waterbury, Conn., has begun to run overtime in its machine department, a condition made necessary by increasing orders, especially for cold rolling machinery. This department, of which Lancaster P. Clark is the manager, manufactures thread rolling machinery, headers, presses, slitters, wire forming machinery and cold rolling equipment. The line is being improved radically by the redesigning of the several types. The company is building the engines for the motor trucks of the R. L. Morgan Company, Worcester, Mass.

The Eastern Machine Screw Company, recently organized under a Connecticut charter to manufacture machine screw products and screw machines, the invention of William Gates, Norwich, Conn., will establish its factory at New Haven, a building permit having been taken out for a structure 42 x 126 ft., one story, the site being on Truman street. The company has a capital stock of \$100,000. Norris S. Lipsett is the president; Joseph E. Hubinger, vice-president; William H. Gates, vice-president and superintendent; Walter S. Garde, treasurer, and Benjamin P. Greene, secretary and manager. The company's temporary manufacturing quarters are in the R. H. Brown Company's building, Ashmun street.

The Orson Automobile Company, New York, will produce 500 cars as the first season's output of the new factory at Springfield, Mass. A large amount of machinery has been installed in the Consolidated Wrapping Machine Company building, Brightwood, and manufacturing will begin immediately. H. B. Layman, an experienced engineer, with long connection with the automobile business, is the president and general manager. The stockholders include many of the most prominent men in New York financial circles. The original announcement was that the car would be built in very limited numbers, for disposal to stockholders only, but present plans indicate a much more comprehensive policy. The machine has a number of original features, in which the designers and their backers have great confidence. The local press states that the company will erect in the near future shops having a floor space of 240,000 sq. ft.

In increasing its capital stock from \$100,000 to \$250,000 the Turner & Seymour Mfg. Company, Torrington, Conn., manufacturer of brass goods and gray iron castings, has taken \$100,000 from surplus in the way of a stock dividend and the remaining \$50,000 will be paid for in cash.

The Belmont Automobile Mfg. Company, which was about to establish a factory in New Haven, Conn., has been petitioned into bankruptcy by creditors.

At a recent meeting of the stockholders of the Mianus Motor Works, Mianus, Conn., it was voted to increase the capital stock from \$100,000 to \$300,000, and an extra stock dividend of 100 per cent. was declared to dispose of a large surplus that had accumulated during the last five years in spite of the fact that the company has paid annually from 10 to 20 per cent. dividends. It was also decided to double the present capacity of the plant, and work on the new buildings will soon be under way, because the company is anxious to get the benefit of the increased output for 1911. The present plant was increased nearly 50 per cent. last year, but did not prove to be large enough, as it has been necessary to run night and day since last winter in order to keep up with orders.

The Bangor & Aroostook Railroad Company of Maine will build in the immediate future a new branch through the towns of Grand Isle, Madawaska, Frenchville and Fort Kent.

The equipment of the Leicester Card Clothing Company, Leicester, Mass., has been purchased by Ashworth Bros. Company, Fall River, Mass.

The project is afoot at Exeter, N. H., to establish an automobile manufacturing business in connection with the plant of the Exeter Machine Works, of which Joseph Symonds is now the head. The board of trade is taking an active interest in the plan, and prominent residents are co-operating to make it a success, if the Exeter Machine Works would be extended for the purpose.

The Cole-Hatch Machine Company, Portsmouth, N. H.,

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has established shops on Stewart's wharf, and will manufacture gasoline engines and do a general repair business.

The improvements which the Boston & Maine Railroad will carry out at Lawrence, Mass., this season will be in the nature of yard facilities rather than in repair shops, though the new roundhouse, with its capacity of 24 locomotives, will have, of course, the usual auxiliary repair facilities. About \$300,000 will be expended altogether, of which \$100,000 will be for the roundhouse.

The International Machine & Screw Company, Springfield, Mass., which will manufacture machine screws by a drawing and rolling process, the invention of George T. Warwick, has tentative plans for the erection of a factory building within the next year. The company has developed interesting special machines which produce machine screws of standard sizes at a very high rate of speed. The machines are manufactured in the company's shops at 172 Lyman street. They will not be marketed for the present, at any rate, the plan being to utilize the invention exclusively for manufacturing its products for the market.

Announcements of additions to manufacturing capacity in New England include the following: Pelley Toilet Paper Company, Fulton, N. Y., factory at Springfield, Mass., 50 x 100 ft., two stories and basement, together with remodeled existing structure; storage warehouse at New Bedford, Mass., to be built by a corporation headed by William M. Butler and Frederick Taber of that city, 100 x 283 ft., six stories, to be equipped with electric hoisting machinery; United States Worsted Company, Lawrence, Mass., six-story mill; Pacific Mills, Lawrence, Mass., dyehouse, printing building, finishing building and power station; Giron Bros. & Co., St. Etienne, France, velvet ribbons, mill at Norwich, Conn., conditional on tax concessions, which have practically been arranged for.

Additional power will be developed as follows: F. W. Bird & Son, paper, Phillipsdale Mill, East Providence, R. I., two-story boiler house, 68 x 156 ft.; Oxford Linen Mills, North Brookfield, Mass., electric light and power plant; Lawton Mills, Plainfield, Conn., electric lighting plant; Connecticut Company, addition to power station at Waterbury, Conn., 98 x 150 ft., two stories, equipped with boilers and engines to develop 8000 hp. One engine will have a capacity of 3000 kw., while two others will be of 1500 kw. each. Worcester Electric Light Company, Worcester, Mass., power station, 100 x 200 ft., Westinghouse, Church, Kerr & Co., New York, engineers, already mentioned with details of equipment.

The New England Paper Box Company, Waltham, Mass., is enlarging its plant by adding another floor to its building.

That multivane fans are being utilized to a greater and greater extent is shown by recent sales of the Massachusetts Fan Company's squirrel cage type, provided with interblades, to Curtice Bros., Rochester, N. Y.; Thos. C. Miller, New York City; Gerry & Northup, Boston, Mass.; Montgomery Ward & Co., Chicago; Edison Electric Illuminating Company, Boston, Mass.; H. Kelly & Co., Minneapolis, Minn.; Wyckoff & Lloyd, Springfield, Mass., and Buerkel & Co., Boston, Mass. The Massachusetts Fan Company's factory is at Watertown, Mass.

President Benjamin Briscoe of the United States Motor Company announces that its Alden Sampson Mfg. Company's plant at Pittsfield, Mass., will be doubled in capacity. Ground will soon be broken for the erection of a new building, 70 x 170 ft., and an additional story is to be erected on the present main building, which is 85 x 100 ft. A new forge and blacksmith shop, 60 x 100 ft., and a paint and testing room, 40 x 150 ft., will also be erected immediately. An investment of \$125,000 for new machine tools has been made and a new building to be used as an engineering department, drafting and testing laboratory will be added to the plant.

### Pittsburgh

PITTSBURGH, PA., June 14, 1910.

Market conditions the past week have not been quite as stable as heretofore, and there is more of a feeling of uncertainty prevailing than has been apparent for some time. Dealers here, however, do not expect this situation to last long, and it only affects new business. For every branch of the metal working industries a busy season is practically assured until well into the fall. There is marked activity at present in the manufacture of various steam specialties, heating appliances, including boilers and radiators, and plumbers' supplies, due to the extensive building operations now in progress throughout the country. From the oil fields both East and West, but especially in the Southwest, there has come to this district all through the spring a very profitable trade in steel derricks, drilling machinery, power equipment, piping, pumps, compressors, &c., and with the opening of summer there has not been the falling away of orders which was generally expected. At some points business is increasing. To a large extent the same houses

are also interested in furnishing supplies for quarries, mines, irrigation projects and water works, in all of which lines there is extraordinary activity.

The machine shop facilities of the Atlas Portland Cement Company at Northampton, Pa., will be reinforced by equipment from the repair plant at Ilasco, Mo., which has been discontinued in consequence of a machinists' strike.

As a part of the new power plant equipment recently provided for, the Chambersburg, Greencastle & Waynesboro Street Railway Company, Waynesboro, Pa., will install a motor-driven centrifugal pumping unit for circulating water in the condensing system.

Plans for the new Hugh Donovan Boiler Works at Parkersburg, W. Va., are nearly completed and construction will begin in the near future.

The Standard Cast Iron Pipe & Foundry Company, Bristol, Pa., has been awarded a large contract for cast iron mains to be used in water works improvements at Newark, N. J.

The Jacobson Engine Company, Chester, Pa., which is making a specialty of producer gas units, has been very successful this year in placing them among industrial plants.

It is reported here that plans are being drawn for a new high pressure pumping station at Harrisburg, Pa.

The Ayrshire Coal Company, Oakland City, Ind., may require some additional equipment in the near future, as it is about to open up one or more new mines near that place.

The Oakley Colony Power Company, Oakley, Ohio, will install a Corliss engine and electric generator of 300 kw. capacity, together with other apparatus, which has already been purchased, including boilers.

Manufacturers here have been advised that bids will be taken by the Board of Trustees of Ohio University, Athens, Ohio, for new boilers, pumps, &c., to be installed in an addition to the power plant. A brick or steel stack is also to be erected.

A steam turbine and generator of about 5000 kw. is to be added to the electric power machinery of the Mahoning & Shenango Railway & Light Company, New Castle, Pa.

The municipal power plant at Martins Ferry, Ohio, which is equipped with four engine-driven generating units, principally of Westinghouse design, has ordered a fifth set rated at 250 kw., making the aggregate capacity of the station about 750 kw. The Russell boilers now installed will also be added to.

The Pocahontas Consolidated Collieries Company will install an induction motor of 175 to 200 hp. for operating and handling machinery at its Mora, W. Va., property.

Two large gyratory breakers have been ordered by the Lehigh Valley Coal Company, one for installation at the Mineral Spring Colliery and the other to be used at the Buck Mountain Colliery, in Wilkes-Barre and Buck Mountain, Pa., respectively. They are of the Gates type.

A gas engine will be installed to furnish power for driving machinery in the new plant of the McDonald Milling Company, McDonald, Pa.

The Pittsburgh office of the Pennsylvania Crusher Company has recently made extensive sales of the hammer type of crushers manufactured by that concern, which are used, among other things, for breaking up coal in power plant service, and also for coking operations.

Reeves Bros., Alliance, Ohio, have taken the contract for the 125 ft. steel frame rotary kilns to be installed in the Sandusky, Ohio, plant of the People's Portland Cement Company, which will be electrically operated throughout.

### Detroit

DETROIT, MICH., June 14, 1910.

Last week the foundrymen's meeting here absorbed the attention of local interests to a considerable extent, and some outside business that would otherwise have been transacted was carried over. Many of the delegates took occasion to open negotiations for machinery and supplies needed at their various plants, and it is probable that quite a number of orders were placed with Detroit dealers or sales representatives; but the bulk of the buying resulting from interviews between foundrymen and supply men at the convention will be done in the usual course through the home offices of the former.

With the possible exception of last fall, there has been no period in recent years when the advantages of arranging shops on the unit plan, and providing for future expansion along certain definite lines, was more apparent than at this time. If the large automobile companies of Detroit and vicinity had rendered no other service to the machinery world, their example in this respect would, of itself, be worthy of all praise.

A subject of frequent remark here this year has been the extent to which threaded iron pipe is being used in every



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part of the continent for carrying steam, gas, water, compressed air, &c.; not that its use is a novelty, but because of the great quantity installed, which has resulted from the extensive improvements in plants and out of door systems everywhere made. One of the natural consequences of this has been a correspondingly heavy sale of pipe threaders and cutters. Many of the machinery houses in this section that supply such apparatus, particularly portable outfits, are already behind on orders and the demand is steadily growing. Thus far second-hand stock has supplied the deficiency, but it may not suffice much longer.

Improved mechanical equipment, including one or more new boilers, will be provided this summer for the municipal plant at Eaton Rapids, Mich. The present electrical capacity of 150 kw. may also be increased.

The Lake Copper Mining Company, Houghton, Mich., is completing extensive improvements, including a 10-ton hoist, 2-stage air compressor and a steam electric power plant.

The W. C. Heller Company, Montpelier, Ohio, which contemplated removal to another city, has decided to remain in its present location. New machinery is to be purchased at once.

The Clayton & Lambert Mfg. Company, Detroit, has let contracts for a new factory building.

The Grabowsky Power Wagon Company, Detroit, has ordered a generating set of 75 kw. and additional motors for its plant.

The Algomah Mining Company, Houghton, Mich., which has been formed to redevelop the old Algomah property, will erect a power and compressed plant in the near future, followed by a hoist and other machinery for mining operations.

The Regal Motor Car Company, Detroit, is making contracts for electric power machinery, including a generator of 150 kw. engine driven, a line of direct current motors, controllers, &c.

Additional operating machinery will be required for the plant of the Flint Box Company, Newaygo, Mich., which is to be enlarged and improved.

Construction of a new water works system, with pumping machinery, showing high economy, is reported to be under consideration by the authorities at Calumet, Mich.

An engine-driven electric generating set of 100 to 125 kw., for furnishing direct current to motors and lights in the implement and vehicle factory, will be installed by the Wayne Works, Richmond, Ind.

Plans for water works extensions, involving the ultimate purchase of additional pumping units, have been made by the city officials at Mt. Clemens, Mich.

The Fleetwood Engineering Company, Flint, Mich., in which John D. Mershon of Saginaw is interested, has entered upon the manufacture of automobile parts.

The new building of the National Steel Casting Company, Montpelier, Ind., to be completed this summer, will be three stories, 60 x 80 ft., of brick, steel and concrete construction.

The pumping engine built by the Laidlaw-Dunn-Gordon Company for the Flint, Mich., water works, and sold through its Detroit office, is now being installed. It will have a capacity, for each 24 hours' service, of 7,000,000 gal.

From Grand Rapids, Mich., it is reported that a combination of interests there known as the Kelsey-Brewer Syndicate, whose exact address is not given, has acquired control of the 750-kw. plant of the Kankakee Electric Light Company, Kankakee, Ill., and will enlarge it. Steam turbine units will probably be installed and the water power further developed. Buckeye engines and Leffel hydraulic turbines are now in service.

The Champion Company, manufacturer of spark plugs for automobile motors, whose product is understood to have been principally contracted for by the Willys-Overland Mfg. Company, Toledo, Ohio, is removing to that city from Boston, Mass., and establishing a plant there.

A machine shop for repair work is to be built in connection with additions which the Huron Milling Company, Harbor Beach, Mich., will make to its plant. The engine room is also to be extended and new machinery installed.

The Lewis Spring & Axle Company, Jackson, Mich., is proceeding with plans for the erection and equipment of a two-story addition to its plant, 60 x 200 ft. The foundation has already been laid.

The Michigan Smelting & Refining Company, Detroit, is preparing to erect three steel frame buildings, each 60 x 300 ft.

One or more electric motors of large capacity will be added to the equipment of the Paul A. Sorg Paper Company's plant at Middletown, Ohio.

J. Wahlman & Son, Ishpeming, Mich., has been awarded a contract for the erection of a power house at the Smith mine, and a crusher and ore sampling house at the Austin mine, on the Swanzy range, both of which properties are operated by the Cleveland-Cliffs Iron Company. The power plant will be equipped with machinery to be operated by the new transmission plant, which has been in the course of

construction on the Cleveland-Cliffs properties for some time.

The Murphy Iron Works, Detroit, has plans prepared for extensions to its foundry, but has not determined whether the work of construction will take place now or in the spring of 1911.

The Reliance Motor Truck Company, Owosso, Mich., subsidiary of the General Motors Company, has plans prepared for buildings to be erected which will comprise practically an entire new factory, although the present plant will continue to be utilized. The dimensions of the main assembling building of the new plant are 348 x 579 ft., two stories. Just beyond this building with a 20-ft. court between, extending the full length of the building, is to be erected the body and paint shop, 227 x 579 ft., two stories. West of this building will be erected a power plant capable of developing 2000 hp. The buildings will be of reinforced concrete construction.

The Detroit Stove Works, Detroit, has just completed an addition to its plant, 48 x 174 ft., four stories, which it will use for the manufacture of warm air furnaces. The foundation is now being laid for another building, 66 x 184 ft., five stories, which will be used as an addition to the stove department. The two additions will be equipped with special machines and tools, the exact nature of which has not been fully determined upon.

The Wilmarth & Morman Company, Grand Rapids, Mich., manufacturer of grinding machinery, advises that it has not made any plans for building a new plant on the site which it recently secured, and that it will not do so during this summer unless unexpected developments arise.

The American Electric Fuse Company, Muskegon, Mich., has in the course of construction a building, 60 x 150 ft., which will be used for the manufacture of enameled magnet wire and coil windings.

The Reynolds Motor Company, Detroit, is erecting an addition to its plant, but advises that details regarding equipment to be installed have not been definitely decided upon.

The Reo Motor Car Company, Lansing, Mich., has under consideration the erection of an addition, 150 x 150 ft., for manufacturing purposes, and a two-story storage building, 100 x 300 ft.

The Couple-Gear Freight-Wheel Company, Grand Rapids, Mich., manufacturer of couple gear trucks, is building an addition to its plant, 50 x 50 ft., which will be used for erecting purposes.

The Cartecar Company, Pontiac, Mich., has taken up an option on several blocks of land adjoining its factory, and plans are now being made for extensive additions to the plant. The work of the construction will be pushed as rapidly as possible, as it is the intention to have the new additions all completed in time to begin turning out the new 1911 models early this fall. With the additions which are contemplated, the Cartecar Company will have one of the largest factories in Pontiac for the building of pleasure automobiles. It will afford over 12 acres of floor space, with exceptional lighting arrangements, and will be modern in every detail.

The Gear Grinding Machine Company, Detroit, has increased its capital stock from \$200,000 to \$300,000. The company is moving into its new factory, which is 65 x 100 ft., three stories. Individual motors will be used for driving all its machinery.

### Milwaukee

MILWAUKEE, WIS., June 13, 1910.

Buying has been liberal throughout the week, with orders well distributed among manufacturers and dealers in the principal lines of production. Representatives of the railroad companies also report heavy shipments in every direction, indicating that the shops are being cleared of considerable work. Collections lately have been excellent.

Orders amounting to about \$1,500,000 have recently been placed with Wisconsin builders for gas engines, gas producers, electric generators, transformers and other equipment comprised in complete power units of sizes ranging from 100 to 4000 hp., while internal combustion motors of smaller capacities, including gas, gasoline and oil engines, are being continuously turned out in such numbers at various manufacturing centers of the State as to materially swell this aggregate. At present it constitutes the largest single line of production. Such specialties, however, in gas power machinery as Allis-Chalmers Co., Fairbanks, Morse & Co. and the Power & Mining Machinery Company have, at different times lately, made it clear that the surface of the business has hardly been more than scratched. With the introduction of a really successful oil gas producer, for

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which everyone is now looking, there will be a demand for gas engines from all points reached by oil pipe lines which no facilities now existing, either in this State or elsewhere, can supply.

As a result of the number of new plants and extensions recently determined upon in this city and vicinity, Milwaukee seems to be the Mecca at present for salesmen covering every branch of shop, foundry, power and general factory equipment. For the most part their experiences bear out very closely the market reports published of late in *The Iron Age*; and with respect to prospects for fall trade the judgment rendered has been generally favorable.

Local manufacturers have closed this month more contracts in the territory east of Chicago than for any similar period this year. At present there appears to be especial activity around Detroit, Toledo, Pittsburgh and Wheeling; and the demand from metal working industries, including furnace plants, steel mills, etc., predominates. Power, electrical and pumping machinery has, in particular, been largely ordered from the plants located here which make a specialty of that apparatus, as well as from the Wisconsin Engine Company at Corliss, Wis., and some smaller builders, including boiler makers. Municipalities, central stations and electric traction lines in the districts mentioned are also buying more freely than they have been.

The Janesville Machine Company, Janesville, Wis., has just let the contract for its new four-story warehouse, which will be 100 x 120 ft., of mill construction.

Work has been commenced at Chippewa Falls, Wis., on the new lock factory which is to be erected for John C. Hansen. The plans provide for a building 60 x 100 ft., equipped with light metal working machinery and tools.

The Milwaukee Machine Tool Company, now located on the north side of the city, will remove to West Allis, Wis., where the site has been secured for a new manufacturing plant 100 x 150 ft. as an initial unit permitting future expansion.

One or more electric motors for foundry service will be needed this summer by the Racine Aluminum & Brass Company, Racine, Wis.

The capacity of the plant operated by the Marinette & Menominee Box Company, Marinette, Wis., is being doubled.

The Kurz-Downey Company, Bayfield, Wis., has recently installed new machinery in its mill and contemplates the addition of some further equipment.

The Crivitz Pulp & Paper Company, Crivitz, Wis., has commenced work on its new water power development.

Cheap hydroelectric power will be held forth by the Marinette, Wis., Chamber of Commerce as one of the inducements to manufacturers to locate in that city. A vigorous campaign for securing new industries is about to be started.

Two tubular boilers, a Corliss engine, dynamo and electric motors for driving machinery will be installed in the new plant of the Kelly-Racine Rubber Company, Racine, Wis. The plans call for a four-story steel-frame building, 60 x 210 ft., with separate power plant.

The Michigan Hoop & Stave Company, Marinette, Wis., is planning the erection, according to reports, of a large electrically operated cooperage plant for the manufacture of barrels, kegs and pails.

A dynamo and motors will be required for the new factory building which the Racine Gas Engine Company is planning to erect at Racine, Wis. The engine used for driving the generator can probably be supplied from the company's present factory.

President Walter H. Whiteside of the Allis-Chalmers Company addressed the Allis-Chalmers Engineering Society, in the clubhouse at West Allis, June 9, on the subject of individual efficiency.

The plant at Manitowoc, Wis., of the Manitowoc Aluminum Foundry Company will hereafter be operated as a branch of the Aluminum Castings Company of Cleveland, Ohio. Conrad Werra, president of the Manitowoc company, will act as State representative for the new owners and is to be in charge of the local plant.

The Booth Mfg. Company, Muskegon, Mich., has been considering a location at Waukesha, Wis., but it is stated that the necessary requirements cannot be met by the commercial interests of that city.

A party of 25 sales managers of the United States Steel Corporation and its subsidiary companies arrived in Milwaukee June 9 on a special car and spent several hours inspecting local machinery building plants, particularly the gas engine and electrical shops at West Allis.

It is reported from Mellen, Wis., that the Pribnow Swage & Tool Works, which will extend its manufacturing facilities, is in the market for a planer, lathe and drill.

The Berlin Machine Works, Beloit, Wis., has received the largest order for wood working machinery let for some

time past, being the equipment for a new electrically operated planing mill to replace the Great Southern Lumber Company's, recently lost by fire at Bogalusa, La.

The Heil Company, Milwaukee, has taken contract for the erection of the Wehr Steel Company's crucible steel foundry in West Allis, Wis.

The Modern Steel Construction Company, Waukesha, Wis., has taken contract for the iron work of the Wisconsin Engine Company's large new warehouse at Corliss, Wis.

The McDonough Mfg. Company, Eau Claire, Wis., has just been awarded contract for the machinery to be installed in the large new timber cutting plant, including band mill, resaw, edgers, trimmers, etc., to be erected by Lee Wilson & Co., at Wilson, Ark. Both steam and motor drives will be used in the plant.

The factory of the Gurney Refrigerator Company, Fond du Lac, Wis., will be enlarged and additional equipment provided.

In line with the policy of expansion previously announced, the Mitchell-Lewis Motor Company, Racine, Wis., has let contract for another three-story building of mill construction.

The Wisconsin Bridge & Iron Company, North Milwaukee, has been awarded a large bridge contract by the Houston Belt & Terminal Railway Company, Houston, Texas.

A three-story brick addition 50 x 100 ft., with some new power and wood working machinery, will be made to the plant of the Northern Casket Company, Fond du Lac, Wis.

The National Brake & Electric Company, Milwaukee, is arranging for the erection of an additional machine shop 186 x 247 ft., three stories, of steel, brick and concrete construction. A large warehouse is also to be built.

In addition to the improvements recently noted, the Central Upholstering Company, Sheboygan, Wis., will install a complete outfit of machinery, electric motors, etc., for the manufacture of furniture.

It is reported from Beloit, Wis., that Fairbanks, Morse & Co. have decided upon the erection of a brass foundry, 70 x 175 ft., and a cleaning department 70 x 200 ft.

A large new factory is to be built in Eau Claire, Wis., by the Schwahn-Scyberth Company.

Motor driven elevating machinery and an automatic shovel will be installed in the fuel yards of the Dodge Lumber Company, Monroe, Wis.

Two tubular boilers of 125 hp. each and considerable other mechanical equipment will be required in a large parochial building at Fond du Lac, Wis., the plans for which are being prepared by John G. Shodron, Milwaukee.

The Menasha Paper Company, Menasha, Wis., has placed an order in Milwaukee for an 18 x 36 in. Reliance engine to be placed in its Ladysmith plant. It will be belted to line shafting operating the machinery.

The Milwaukee Board of Public Works will ask the common council for authority to purchase a portable stone crusher of a size sufficiently large to use in furnishing material for macadamized streets.

At the Duluth office of the Standard Oil Company, according to advices received here, the contract will be let shortly for four steel storage tanks to be erected in Superior, Wis.

The Wisconsin Motor Mfg. Company, which was organized in North Milwaukee, Wis., with a capital stock of \$200,000, has purchased a site adjacent to the Chicago & Northwestern Railway tracks in West Allis, Wis., and will build a large plant there for the manufacture of automobiles. The main building is to be 115 x 290 ft., with a separate power house 50 x 50 ft., and other structures will be erected as the business develops. At the present establishment 200 men are employed. Charles F. John is president, Edw. H. Schwartzburg vice-president and A. F. Milbrath secretary and treasurer.

The C. Reiss Coal Company, Sheboygan, Wis., will rebuild its docks at Manitowoc, Wis., and install new electrically operated handling machinery similar to that recently ordered for the Sheboygan plant, if the city makes the necessary improvements to permit better access to the property by vessels.

The Hilker-Wiechers Mfg. Company, Racine, Wis., will purchase a gas producer plant, gas engine of 150 to 200 hp., dynamo and line of small electric motors. An addition to the factory is now being erected.

The Ferromatic Tire Mfg. Company, which has been operating in a city outside of this State, has incorporated in Wisconsin and will establish a plant at Manitowoc, Wis.

The Jacob J. Vollrath Mfg. Company, Sheboygan, Wis., advises that it will not erect its new power plant until the last of this year or possibly later, the delay being caused by the inconvenience it is having in moving its equipment into the new plant recently erected without interrupting manufacturing operations.



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### The Southwest

KANSAS CITY, Mo., June 13, 1910.

Some dealers report rather a dull business for the past few days, so far as new inquiries are concerned, but others have had a good run of orders, and conditions generally are regarded as favorable. In the buying now being done, machinery for factories other than metal working establishments leads by a wide margin. Requirements for machine shops and foundries seem to have been filled for the present. Railroads are understood to be placing a number of good orders in the East for car shops at Wichita and several repair plants in Texas and Oklahoma, various details of which will be purchased here later on, but the large lists have apparently been given out first in New York and Pittsburgh.

Machinery for mining and ore reduction sells fairly well. Around Joplin, Mo., and in some more southerly districts the activity is especially pronounced. Development work that began some months ago is being vigorously pushed, with consequent purchases of equipment for the purpose, and the mills and smelters are increasing their capacities. In Bartlesville, Okla., Caney, Kan., and Neodesha, Kan., improvements have either been made to the principal plants or furnace additions are pending. Permanent investments have been held back to some extent by the uncertainty of the future market for lead and zinc products.

There is hardly a wood working shop in the Southwest that will not add to its facilities this year, as every establishment of that character is crowded with work, many of them being far behind on orders now in hand. The new shops or additions recently planned practically all include provision for electric motor drive; and quite a number of owners have concluded to put in their own generating plants. The choice of a prime mover seems to fall in most cases on a gas or oil engine.

The Oklahoma Iron Wire Fabric Company has put in service a large new plant at Enid, Okla., which employs several hundred men. Its line of products involves the use of sheets as well as wire.

The Webb City & Carterville Foundry & Machine Company, Webb City, Mo., which has already been adding to its Joplin plant, is reliably reported to have in contemplation plans for further increasing its capacity.

Three tubular boilers, a steam pump of 200,000 gal. daily capacity, tandem Corliss or four-valve engine with two 100 kw. dynamos, with auxiliary apparatus, also motor-driven deep well pumps, will be bought by the city of Moberley, Mo. Plans and specifications are in the hands of L. G. Knapp & Co., Kansas City.

Installation of pumping machinery for city service will be made in the near future at Canadian, Okla.

Some handling equipment will be required by the Southern Pacific Railroad Company for a new dock to be built on the water front at Houston, Texas.

The W. K. Palmer Company, Kansas City, are engineers for a 5000 kw. hydroelectric plant to be constructed on the Niobrara River, near Valentine, Neb., which will furnish power for a traction system.

The pumping plant at Alamogordo, N. M., which has been purchased by the Alamogordo Improvement Company, will be enlarged and some new equipment installed.

Choate, Cooper & Co., El Paso, Texas, who handle power, pumping and hoisting machinery, including boilers, have had a very active business lately in the mining districts on both sides of the border.

The Houston Blowpipe & Sheet Metal Works, Houston, Texas, has been working to its full capacity on orders from various parts of the Southwest, including Mexico. One of the contracts recently filled was for a large blast system in connection with the smelter of the Compania Fundidora de Fierro y Acero de Monterey, of Monterey, Mexico.

The Scott Mfg. Company, recently organized at Helena, Ark., is providing equipment for a large wood working plant.

The San Luis Power & Water Company, which will undertake a number of hydroelectric power developments and build pumping plants for irrigation service, has established offices at Costilla, N. M. The principal stockholders live in Colorado Springs, Colo.

The Compania Minera El Barreno y Annexas, Mexico City, D. F., will install grinding and pulverizing machinery, consisting in part of a tube mill and a ball mill. The plant is electrically operated.

A large hydroelectric plant on the Grand River, about 25 miles from Muskogee, Okla., is being planned in connection with the system of the Muskogee Gas & Electric Company. The work has already been outlined, but definite arrangements are still pending. H. M. Byllesby & Co., Chicago, Ill., are interested in this property.

The Newton Electric Light & Power Company, Newton, Kan., which operates two General Electric generators of 250 kw. driven by engines of the C. & G. Cooper Company's build, will probably arrange this summer for the installation of another unit. Its present battery of Kewanee and Brownell boilers is also likely to be increased.

The H. Pauk & Sons Mfg. Company, St. Louis, Mo., has let contracts for a three-story factory building, 54 x 130 ft. A pump with capacity of 1000 gal. per minute has been installed on the seventh level of the Arizona Commercial Copper Company's mine, Globe, Ariz. It is electrically operated. The smelter run in connection with this property has been closed for the present, pending further development work.

The Houston Light, Heat & Power Company, through its engineers, Ford, Bacon & Davis, has placed an order with Allis-Chalmers Company, Milwaukee, Wis., for a 3000 kw., 2300 volt, 60 cycle, three-phase, 1800 rev. per min. steam turbo generator. This will be installed during the present summer to care for next winter's peak load.

A modern high duty pumping engine of 1,000,000 gal. daily capacity will be purchased for installation at Woodward, Okla., if the proposed municipal improvements are put into effect.

It is stated, on what appears to be reliable information, that the Overland Automobile Company, Indianapolis, Ind., will erect a branch factory in Fort Worth, Texas.

The Morris Mfg. Company, Little Rock, Ark., whose organization was recently reported, will not erect a plant until later, as advantageous arrangements can be made to have their work done in local shops and foundries.

The Charter Oak Stove & Range Company, St. Louis, Mo., is having plans prepared for a new plant, details of which have not yet been worked out.

The Rogers Machinery Company is a new firm at Rogers, Ark., which is erecting a shop to do general repair work. F. F. Freeman is president.

The Southwest Universal Pump Company has been organized at Kansas City for the purpose of manufacturing Universal double acting pumps. Present machinery requirements have been filled. George J. McCutcheon is secretary.

### The South

NASHVILLE, TENN., June 13, 1910.

Trade appears to be gradually slowing down, so far as new negotiations are concerned. Inquiries made some weeks ago are, however, still being acted upon, with a fair percentage of sales; and manufacturers, as well as jobbing houses, have in hand a great many contracts of a widely varied character which it will take some time to fill. Plants that depend for their business mainly upon orders for contractors' outfits are among the most favorably situated of any with respect to future trade, as the need of equipment for work now in progress exceeds, by far, that of the best previous seasons. In this line of supply, Northern manufacturers are doing well also, and their agents seem to be very active all through the districts where operations are notably active. This applies to every thing coming under the head mentioned.

The present steam-electric plant of the Consolidated Ice & Power Company, Valdosta, Ga., is to be replaced by a large new generating station, the principal equipment for which has been already ordered. The boilers installed in the original plant were furnished by the R. D. Cole Mfg. Company, Newnan, Ga.

The Southern Motor Works has been incorporated for \$400,000 by A. H. Robinson, Exile Burkett and others to establish at Nashville, Tenn., the automobile plant mentioned last week, a building for the first unit of which has already been secured. Machinery will be partially supplied from the works of the Southern Motor Company, Jackson, Tenn.

J. F. McIntyre & Son, Memphis, Tenn., will install a new timber cutting and woodworking plant near Pine Bluff, Ark.

It is reported from Graceville, Fla., that funds are being provided there for an electric power unit to furnish lighting.

The Edgewood Consolidated Coal Company, recently organized, with headquarters at Knoxville, Tenn., will control a number of important mining properties in the vicinity of Shamrock, Ky., and Edgewood, Tenn. These are now electrically operated and it is expected that additional equipment will be installed in order to enlarge the production.

The Henderson-Sturges Piano Company, mentioned last week, has been incorporated in Alabama for \$150,000, and its headquarters are to be at Anniston, Ala., where it will build a factory.

The authorities at White Springs, Fla., are considering the installation of pumping machinery and a complete water and sewage system.

## THE MACHINERY MARKETS

A mechanical filtration plant will be installed by the Decatur Water Works Company, Decatur, Ala.

Power and pumping machinery will be required in the near future for water and sewage service at Ashboro, N. C. Bids have not yet been called for.

The Chattanooga Machinery Company, Chattanooga, Tenn., is installing machinery in a new timber cutting plant being erected by Sigler & Embrey, whose main offices are in the Chronicle Building, Houston, Texas.

A pumping unit will be installed by the city of Savannah, Ga., in the Bonaventura water works station.

In line with its requirements, as recently mentioned, the Knoxville Railway & Light Company, Knoxville, Tenn., has contracted for the installation of a steam turbine of 4000 hp. direct coupled to an enclosed type turbo-generator of corresponding capacity.

Bids are now being taken on hydraulic turbines and electrical equipment for the power plant which the city of Bedford, Va., is having constructed.

Purchase of generating machinery and pumping units for the new municipal service station at College Park, Ga., will be undertaken in the near future.

The Barber Asphalt Company has located its general Southern headquarters in the Chamber of Commerce Building, Birmingham, Ala. Charles S. Wadsworth will be manager, and will have charge of the territory embracing Alabama, Georgia, North and South Carolina, Louisiana, Mississippi, Texas, New Mexico and Arizona.

The Sampson Power Company has been incorporated at Clinton, N. C., with \$10,000 capital stock, for the purpose of erecting an electric lighting plant. C. W. Petty is one of the incorporators.

The Dixie Laundry Machinery Mfg. Company, Greensboro, N. C., which is the only laundry machinery manufacturing company in the Southern States, is steadily increasing its manufacture of modern laundry equipment. The company is making a specialty of single belt washers.

### The Northwest

MINNEAPOLIS, MINN., June 13, 1910.

In the line of shop and erection machinery the tools, pneumatic appliances, &c., used for tank, plate and fabricating work have been most in demand of late, owing to the building rush that is still on, helped out by the preparations at mills and elevators to provide storage facilities for the coming grain crops. A great deal of equipment that has been worn out needs to be replaced, and the tendency this season is to discard a larger percentage of old apparatus than usual in order to secure more speed in operations by means of the best modern appliances.

The growth of electric power service is, in fact, one of the principal features of the season's trade. Dealers throughout the Northwest, at the leading centers of distribution, carry heavy stocks of the smaller machinery, together with detail apparatus of all kinds, and most of them have agency arrangements for the sale of heavy engines, dynamos, excitors, &c. Salesmen from the large manufacturing companies are also established in branch offices and make a very close canvass of the territory. So far not a complaint has been heard from any of them as to trade conditions.

The Park Wagon Stock Company, Minnesota Transfer, Minn., is arranging to light its plant with electricity and drive part of its machinery by motors. It will install a 75-kw. direct current generator, with Corliss engine for driving it, and a line of electric motors. Other apparatus is also included in an order recently placed.

Following the installation of a large Corliss engine at one of its properties, the Shenango Furnace Company, Hibbing, Minn., has contracted with Eastern builders for another machine of the same type and a direct current generator of 125 kw. capacity.

McGill, Warner & Co., St. Paul, Minn., will install electrical machinery, including an engine driven generator of 75 kw. for direct current.

It is probable that an elevated steel tank of 150,000 gal. capacity will be erected at Grand Rapids, Minn., and a pumping unit installed for municipal water service.

The Northwestern Electrical Equipment Company, St. Paul, Minn., has ordered for installation in a power plant which it is equipping three Triumph generators, having an aggregate capacity of 225 kw. each, to be engine driven.

The authorities at Robbinsdale, Minn., are planning installation of an electric power plant.

Through its representatives at Spokane, Wash., the Washington Machinery & Supply Company, a great deal of mining equipment, such as drills, hoists, &c., has been placed in the West since January, by the National Iron Company, Duluth, Minn.

A new building 120 x 150 ft. will be erected in Minneapolis

by the Great Northern Implement Company to replace the structure recently burned.

A boiler of 200 hp., Corliss engine of 150 hp. and an alternating current generator will be required for the municipal power plant at Beach, N. D. The auxiliary apparatus includes a feed water heater and deep well pump. Construction of the building is to begin at once.

A new electric power station is to be erected by the city of Buffalo, Minn., which now buys current from a local mill. Generating machinery will be needed.

The Power plant of the Blue Earth City Mill Company, Blue Earth City, Minn., will be enlarged and a new Corliss engine installed.

The Wasp Mining Company, Deadwood, S. D., will extend its mechanical equipment. The machinery has already been purchased.

The Minneapolis Steel & Machinery Company, Minneapolis, has increased its capital stock to the extent of \$250,000, the increase being necessary for additional working capital. The company is not contemplating any extensive additions at this time, but advises that it will do some building in the near future.

The Watertown Steel Tank & Metal Culvert Company has been incorporated at Watertown, S. D., by A. E. Hathaway, A. A. Ackerman and others, with \$25,000 capital stock. The company is moving a plant from Sioux City. The new buildings will be 40 x 50 ft. and 100 x 160 ft. Some additional metal working equipment will probably be required.

### The Farther Central West

OMAHA, NEB., June 13, 1910.

Indications point to the continuance of the present run of buying, which is more for the account of manufacturing plants than for some weeks. For power plants of various kinds Eastern concerns have taken some contracts aggregating considerable amounts. During the summer there will be an uncommonly large number of pumping plants installed by municipalities, railroad companies, water companies and industrial establishments, also by the Western mines, ore mills and smelters. To quite an extent centrifugal pumps are called for, and motor drive is more often specified than ever before.

The sale of air compressors, too, has reached noteworthy proportions, owing to the amount of development work now being carried on west of Denver, as well as to the higher pressures required for pipe lines and the increasing use of pneumatic apparatus in industrial service. Small electrically operated outfits are popular for many operations.

A new power house with modern equipment will be provided for the extended plant of the Davenport Locomotive Works, Davenport, Iowa. Arrangements have not yet been fully completed.

The Wanakak Mining Company, Ouray, Colo., is about to install a new air compressor and will be in the market during the year for other apparatus.

Considerable new equipment, including probably power machinery, will be required in the near future for the Creighton Roller Mills, Creighton, Neb.

It is reported from Oskaloosa, Iowa, that a factory for the manufacture of boilers for heating plants, also cast iron radiators, will be erected by the Ideal Heating Company.

An engineer has been engaged by the authorities at Strawberry Point, Iowa, to prepare plans for an electric power and lighting station of 50 to 75 kw. capacity.

A gas producer power plant of 250 kw. has been completed at Modena, Utah, by the Gold Springs Mining & Power Company. The machinery in the company's mines and ore reduction mill, which has heretofore been operated by means of gasoline engines, will henceforth be driven by electric motors.

The authorities at Mount Ayr, Iowa, have engaged an engineering firm to prepare plans for a pumping station.

The F. M. Davis Iron Works Company, Denver, Colo., finds that trade in mining, milling and smelting machinery shows considerable improvement over what it was a few months ago. R. B. McConney, who was for many years the district manager of Allis-Chalmers Company for central western territory, recently acquired a large interest in the Davis works and is now general manager.

Additional boilers, hoists and a large air-compressor will be installed by the Rexall Gold Mining Company on its property near Victor, Colo.

In the great variety of sheet metal work required for the extensive hydroelectric power developments of the intermountain States, the Vulcan Sheet Metal Company, Denver, Colo., is now finding one of the best sources of business. Stacks, tanks, &c., for the ore mills and smelters also furnish a very satisfactory line of orders.

The Creighton Gas, Electric Light & Power Company,



## THE MACHINERY MARKETS

Creighton, Neb., which has an S. Morgan Smith turbine of 125 hp. driving a General Electric generator, will build a new dam and enlarge its hydroelectric plant for the purpose of furnishing commercial day load.

The Royer-Myers Mfg. Company, recently organized at Janesville, Iowa, will build a factory 50 x 100 ft. for the production of gasoline engines, cement mixers, tile machines, &c.

One of the most extensive economizer systems used in connection with any steam generating plant in the country is about to be installed by the Omaha & Council Bluffs Street Railway Company, Omaha, Neb., in which the fans used at the power house for the induced draft system will be driven by two non-condensing Corliss engines.

W. J. Bowen & Sons, Nashua, Iowa, are about to let contracts for a concrete dam and concrete flumes, preparatory to the construction of a hydroelectric plant.

The Northern Colorado Power Company, Denver, Colo., contemplates the installation of a large motor-driven pumping plant near Loveland, Colo., the construction of which is contingent upon securing control of what is known as the Boyd Lake reservoir. The object of this enterprise will be to furnish irrigation for the district between Loveland and Greeley, Colo.

The authorities at Murray, Utah, have had plans prepared for a water works system, which will include an elevated steel tank and motor driven centrifugal pump of considerable capacity.

Machinery for the generation of electric power will be installed in a new municipal plant, the construction of which was recently decided upon at Paullina, Iowa.

An engine and direct current generator of 100 to 125 kw. capacity, together with other apparatus, will be provided for the power plant of the Utah Gas & Coke Company, Salt Lake City, Utah.

### North Pacific Coast

SEATTLE, WASH., June 10, 1910.

While the market for machinery has not been seriously affected by the more or less abortive attempts to bring about a general strike of machinists on the north coast, this, with other disturbing elements, contributes toward making trade rather slower than heretofore. It is, however, time for the usual summer quiet, and a slackening of trade along nearly all lines will occasion no surprise.

Just at present the Alaskan market is being looked to for purchases of machinery and supplies to carry the various mining and other exploitation companies through the coming winter. This is particularly true with reference to equipment, which must be ordered from the East, and the principal agencies on the coast are carrying on a brisk correspondence with their several houses. Turbines, engines, generators, motors, pumps, compressors, &c., seem to be wanted to a very much greater extent than last year at this season, as most of the Alaskan companies were then still pursuing a policy of retrenchment. The crushing machinery now required is also of a heavier type than formerly, and for other apparatus used in ore reduction plants an increased capacity per hour is usually demanded. Contracts for dredges to be taken up the Yukon were placed some time ago, and these will be among the earlier shipments, followed by other equipment which takes the longest time for delivery, erection, &c. As the summer draws to a close only small apparatus will be ordered.

A belted dynamo of 150 kw. and alternating current motors for connection to various machines has been bought by the Robinson Mfg. Company, Everett, Wash.

The Pacific Ore Reduction Company, Republic, Wash., has started work on a large plant, the equipment for which will include heavy gyratory crushers, Chilean mills, trommels, elevators, air compressor and power machinery. Most of the apparatus needed has been bought.

An electrically driven timber cutting plant, with fully equipped machine shop in connection, is being completed at Ione, Wash., by the Panhandle Lumber Company. Power is furnished by two turbines of 1000 hp. each, driving alternating current generators. The buildings are of steel frame construction. For handling material over the 25 miles of railroad track in and about the plant, electric locomotives will be used.

Deep well pumps will be required for municipal service at Vale, Ore., if the present project for a water works system is carried.

A new company, known as the Kingsley Chemical Reduction Company, has been formed in Spokane, Wash., by Geo. E. Kingsley, to erect a 50-ton white lead plant at Atlas, Idaho, at a cost of \$300,000.

The Rogue River Water & Power Company, Gold Hill, Ore., has appropriated funds for a large hydroelectric plant, work upon which is to begin this summer.

The Olympic Power & Development Company, Port Angeles, Wash., has been granted a franchise by the City Council for light and power purposes, and will erect a power plant on the Elwha River, five miles west of Port Angeles, the initial capacity of which will be 5000 hp. It is expected that the work of construction will commence within a short time.

The Columbia Contract Company, Portland, Ore., has purchased a tract of ground in that city, which it will improve by the erection of two large paving plants and the installation of bunkers for handling crushed rock.

### Government Purchases

WASHINGTON, D. C., June 13, 1910.

The Paymaster-General, Navy Department, Washington, will open bids June 21, under schedule 2575, for one heavy planing machine, and under schedule 2576 for one vertical duplex pump. The same department will open bids June 28, under schedule 2566, for two motor-driven centrifugal drainage pumps.

The commanding officer, Rock Island Arsenal, Rock Island, Ill., will open bids June 29 for furnishing four horizontal tubular boilers, 72 in. x 18 ft., to carry 100 lb. steam pressure.

The Isthmian Canal Circular 589 calls for bids to be opened June 28 on one locomotive crane, steel plates, etc.

The Bureau of Supplies and Accounts, Navy Department, Washington, opened bids June 7 for the following:

Class 71, one electric driven rotating pillar crane—Bidder 7, Brown Hoisting Machinery Company, Cleveland, Ohio, \$1840; 105, Marine Electric Company, Portland, Ore., \$1768; 162, Whiting Foundry Equipment Company, Harvey, Ill., \$2065.

Class 111, one geared friction head screw machine—Bidder 41, the Dreeses Machine Tool Company, Cincinnati, Ohio, \$1110; 63, Garvin Machine Company, New York, \$1600; 89, J. P. Kemp, Baltimore, Md., \$879.50; 100, Manning, Maxwell & Moore, New York, \$850.

Class 112, one universal turret lathe—Bidder 41, Dreeses Machine Tool Company, Cincinnati, Ohio, \$880; 100, Manning, Maxwell & Moore, New York, \$745.

Class 151, one jig saw—Bidder 10, Bentel & Margedand Company, Hamilton, Ohio, \$280; 57, J. A. Fay & Egan Company, Cincinnati, Ohio, \$320; 100, Manning, Maxwell & Moore, New York, \$345.

Class 152, one band saw—Bidder 3, American Woodworking Machinery Company, Rochester, N. Y., \$550; 57, J. A. Fay & Egan Company, Cincinnati, Ohio, \$415, \$373, \$440, \$400, \$520 and \$480; 58, Edward Fay & Son, Philadelphia, Pa., \$588; 89, A. P. Kemp, Baltimore, Md., \$647.50; 100, Manning, Maxwell & Moore, New York, \$585 and \$640; 115, Oliver Machinery Company, New York, \$517, \$409, \$380, \$400 and \$380; 120, J. W. Paxson Company, Philadelphia, Pa., \$588.50.

### To Make Balata Belting in the United States

A combination of German and American capital has been arranged to build a large plant in the United States for the manufacture of Balata belting. Although a large quantity of this belting is used in this country, at present none is made here. The Victor-Balata & Textile Belting Company has been formed, and those interested are Charles E. Aaron and John R. Stein, president and treasurer respectively of the New York Leather Belting Company, and William Vollrath, Albert Vollrath and Edwin Vollrath, of the firm of C. Vollrath & Sohn, Blankenburg, Germany. Charles E. Aaron, New York, is president of the new company; Edwin Vollrath, Blankenburg, Germany, secretary, and John R. Stein, New York, treasurer. A plant will be built at Easton, Pa., costing \$500,000. The factory site will have about nine acres of ground and a spur will be built, connecting with the Lehigh Valley Railroad. Practically all of the machinery will be imported. The process of making Balata belting is not protected to any extent by patents, being largely secret, and most of the machinery used is specially designed.

The Texas Railroad Commission has approved an application of the International & Great Northern for the adoption of a rate of \$1.34 per ton for the transportation of iron ore, carloads, minimum weight 50,000 pounds, from Jefferson to Texas City and Galveston. Recently the commission authorized a rate of \$1.50 per ton for the same movement and the new rate is a reduction. This is the Texas ore which is to be shipped to Pennsylvania steel works, and the first cargo was loaded at Texas City last week.

## Obituary

ROBERT H. BOGGIS, president of the Taylor & Boggis Foundry Company, Cleveland, Ohio, and one of the most prominent iron founders of that city, died June 10, aged 75 years. He had been ill for about three months. The immediate cause of his death was pneumonia. He was born in Geneva, N. Y., and went to Cleveland in 1853. After being in the employ of the George Worthington Company, hardware dealers, for four years, he went to Lockhaven, Pa., where he was engaged in the hardware business for 18 years. In 1860 he was married to a daughter of Harvey Taylor, an iron founder in Cleveland. In 1875 he returned to Cleveland and engaged in the foundry business with his brother-in-law, Herbert F. Taylor, who had succeeded his father in the business. When H. F. Taylor died in 1883 the firm was changed to the Taylor & Boggis Foundry Company. Mr. Boggis was a member of the Cleveland Chamber of Commerce and was much interested in civic affairs. He leaves two sons, H. J. and Taylor H. Boggis, the former secretary of the Taylor & Boggis Company, and one daughter, the wife of B. F. Wade, treasurer of the company.

EDWARD C. HEGELER, La Salle, Ill., who, with F. W. Matthiessen, founded the Matthiessen & Hegeler Zinc Company of that city in 1858, died June 4, aged 75 years. He was born in Bremen, Germany, completed his education at the Polytechnic School, Hanover, and the School of Mines, Freiberg, and in 1857 came to America in company with Mr. Matthiessen, his life-long associate, engaging in zinc smelting. They chose La Salle as the site for their operations on account of the abundance of coal and advantages in transportation, the old Illinois and Michigan Canal being an active avenue for traffic. Zinc mining and smelting was then in its infancy in this country. They suspended operations for a time during the Civil War, but resumed again in 1862 to supply the demand for spelter in the manufacture of arms and cartridges. In due time they built up the largest zinc smelting establishment in the world. Mr. Hegeler had 10 children of whom seven survive. Mrs. Hegeler died in 1908. The oldest daughter, Mrs. Mary Hegeler Carus, has been president of the company for some years.

WILBUR W. BANKS, general superintendent of the bridge shops of Lewis F. Shoemaker & Co., Pottstown, Pa., died suddenly June 8, following an operation for appendicitis, aged 56 years. Mr. Banks learned the trade of machinist at the Phoenix Bridge Works. He later entered the employ of Cofrode & Saylor at Pottstown and rose rapidly to the position of master mechanic. For a short time preceding the closing of the plant he acted as superintendent. He next became superintendent of the Baltimore Bridge Company, resigning to accept the position he held at the time of his death. He leaves five sons and one daughter. One son, L. R. Banks, has been assistant superintendent of the Pottstown shops for about a year.

CHARLES A. GLASER, secretary and treasurer of the Garland Nut & Rivet Company, and assistant secretary of the Garland Corporation, died at Munhall, Pa., June 12, aged 39. He leaves a wife and one daughter.

FREDERICK W. SIVYER, president of the Northwestern Malleable Iron Company, Milwaukee, Wis., died in that city June 11.

WALTER S. MENDENHALL, vice-president of the Sam'l C. Tatum Company, Cincinnati, died June 11, at Avondale, a suburb of that city. He was born in Richmond, Ind., graduated at Providence, R. I., from a Friends' institution; later entered law school at Bloomington, Ind., from which he graduated in 1879. Going to Cincinnati in 1885 he became in two or three years identified with the Sam'l C. Tatum Company, and upon the incorporation of the business in 1891 its

vice-president. Mr. Mendenhall combined unusual inventive talent with thoroughness in manufacturing, and his administration was marked by a considerate interest in the company's employees. He leaves a widow, a son and a daughter.

## The International Steam Pump Company

The annual report of the International Steam Pump Company for the fiscal year ending March 31 was submitted to the stockholders May 10 and has now been made public. President Benj. Guggenheim calls particular attention to the unfavorable trade conditions which prevailed during the first half of the year and states that it was only during the last half that business approached its normal status. Out of the total sales two-thirds were made during the second half, which the president believes augurs well for the future. He further says: "The total net earnings for the year amount to approximately \$2,000,000, as compared with \$1,447,652.94 for the preceding year and \$1,618,506.17 for the year before that. In order to appreciate the full import of these figures it is necessary to remember that while the volume of business in 1909 was only 65 per cent. of that of 1908, the profits were equal to 90 per cent. of those for the year 1908, and that during the year just completed, whereas the volume of business was only 85 per cent. of 1908, the profits were equal to 124 per cent. of those for the year 1908. The profits of the year just closed were about \$700,000 in excess of requirements for fixed charges and preferred dividends. Of this amount, about \$118,000 will be used to retire bonds of the Blake & Knowles Steam Pump Works, leaving thereafter only \$194,970 of these bonds still outstanding." The president predicts that if the current year's business continues as at present this year's profits will produce a surplus of about 7 per cent. on common stock outstanding.

Attention is called to the large additions to the plant of the Power & Mining Machinery Company at Milwaukee, which cost over \$750,000. The company also acquired the Jeanesville Iron Company and a controlling interest in the Denver Rock Drill & Machinery Company. The foreign business shows signs of continual improvement. The following shows the net profits and comparative statement of increase over the previous year:

	1910.	Increase.
Total net profits.....	\$2,515,211	\$545,308
Depreciation, &c.....	512,058	68,058
Balance.....	\$2,003,153	\$477,250
Fixed charges.....	440,732	*12,269
Balance for dividends.....	\$1,562,421	\$489,519
Dividends.....	859,938	.....
Surplus.....	\$702,483	\$489,519

\* Decrease.

Below is given a condensed statement of the assets and liabilities of the company, together with the comparative figures of last year:

Assets.		
	1910.	1909.
Real estate, &c.....	\$34,112,886	\$33,249,926
Discount on bonds.....	1,193,030	125,308
Manufacturing materials, supplies, &c.....	6,911,922	5,298,563
Accounts and bills receivable.....	3,286,028	2,594,425
Miscellaneous.....	679,697	574,849
Associated companies' balance.....	31,168	53,950
Cash.....	574,204	627,888
Totals.....	\$46,788,944	\$42,524,909
Liabilities.		
Capital liabilities.....	\$41,069,518	\$36,226,305
Trade accounts.....	380,156	192,873
Miscellaneous.....	158,581	152,955
Held for dividends.....	170,388	170,411
Reserve for completion of contract.....	.....	2,848,219
Reserve operation sinking fund.....	633,493	525,619
Undivided profits.....	3,340,648	.....
Surplus capital.....	973,221	910,527
Notes payable.....	62,939	1,498,000
Totals.....	\$46,788,942	\$42,524,909



## The Steam Engineers' Convention

### A Large Exhibit Made of Steam Specialties and Supplies

The twenty-fourth annual convention of the Supreme Council of the American Order of Steam Engineers was held in Philadelphia, Pa., June 6 to 10, inclusive. In connection with the convention the annual exhibit of the American Supply Men's Association was held. The meetings of the Supreme Council as well as the exhibition were held in the Odd Fellows' Temple, the auditorium of which was filled to its capacity with exhibits of steam specialties and supplies.

The exhibition was the largest and the most complete that has ever been shown. For 20 years these exhibitions have been held in connection with the convention, for five of which they have been conducted by the American Supply Men's Association, an organization of the exhibitors in the steam specialty and supply line. Eighty booths of uniform design furnished attractive spaces for the display of the various manufacturers' and merchants' lines, included among which were the following Philadelphia concerns:

Harrison Safety Boiler Works, Cochrane steam stack, cut-out valve, heater and receiver.  
H. B. Underwood & Co., cylinder boring and crank pin turning machines.  
E. F. Houghton & Co., oilers and filters.  
Vilter Mfg. Company, representing the Mechanical Refrigeration Company.  
Parker Boiler Company, boiler specialties.  
Valvoline Oil Company, cylinder and lubricating oils.  
George W. Lord Company, boiler compounds.  
W. B. McVicker Company, chemical engineer.  
Pennsylvania Flexible Metallic Tubing Company, metallic tubing.  
Cyrus Borgner Company, firebrick.  
American Radiator Company, Bundy valve department, steam traps and separators.  
H. Belfield & Co., valves, injectors, &c.  
Cancos Packing Company, Black Squadron packing.  
James F. Marshall Company, engineers' specialties.  
Dexter Engineering Company, Utility steam specialties.  
Imperial Engineering & Mfg. Company, elevator guides and lubricant.  
Mason Coal Company, steam coal.  
France Packing Company, packings.  
Philadelphia Grease Company, greases.  
Central Construction Company, representing the York Mfg. Company, York, Pa., ice making and refrigerating machinery.  
Engineering Equipment Company, representing the Coudit Electric Mfg. Company, Boston, Mass.  
Manning, Maxwell & Moore, machinery and supplies.  
Quaker City Rubber Company, Daniels P. P. P. packing.  
Thomas C. Warley & Co., boiler compounds.  
Watson & McDaniel Company, steam and water specialties.  
McArdle & Cooney Company, steam specialties.  
Fairbanks Company, machinery and steam specialties.  
Keystone Lubricating Company, greases.  
Chas. H. Casper, contracting engineer.  
O. F. Zurn Company, oils.  
Wil Kirk Electric Company, representing the Bryan Marsh Company, Central Falls, R. I., electrical apparatus.  
Garlock Packing Company, packing.  
John R. Livezey, pipe coverings.  
Frick Grate Bar Company, grate bars.  
Albert Schade Company, steam and water specialties.  
Crandall Packing Company, packing, gaskets, &c.  
Anchor Packing Company, Tauril high pressure packing.

The exhibitors from cities outside of Philadelphia were:

Ashton Valve Company, Boston, Mass., valves and steam gauges.  
Home Rubber Company, Trenton, N. J., N. B. O. packing.  
Warren Webster & Co., Camden, N. J., vacuum feed water heaters, purifiers and cleaners.  
Lagonda Mfg. Company, Cleveland, Ohio, tube cleaners and valves.  
H. W. Johns-Manville Company, New York and Philadelphia, asbestos packings.  
Lunkenheimer Company, Cincinnati, Ohio, valves.  
J. H. Williams & Co., Brooklyn, N. Y., Vulcan Bijaw wrench, forgings, &c.  
Roto Company, Hartford, Conn., tube cleaners.  
American Steam Gauge & Valve Mfg. Company, New York, gauges and valves.  
Pringle Electrical Mfg. Company, New York, electrical appliances.  
Phoenix Iron Works, Meadville, Pa., boilers, stacks and engines.

Bird-Archer Company, New York, boiler compounds.  
Strong, Carlisle & Hammond Company, Cleveland, Ohio, steam traps.  
Dyna-Coma Company, Boston, Mass., National safety gaskets.  
Peerless Rubber Company, New York, Rainbow packing.  
Underfeed Stoker Company, Chicago, Jones stoker.  
Nelson Valve Company, Wyndmoor, Pa., valves.  
Dearborn Drug & Chemical Works, Chicago, boiler compounds.  
Jenkins Bros., New York and Philadelphia, valves.  
Cortay Packing Company, Trenton, N. J., packing.  
Greene, Tweed & Co., New York, Palmetto packing.  
Scully Steel & Iron Company, Chicago, valves and boiler supplies.  
McLeod & Henry Company, Troy, N. Y., steel Mixture firebrick.  
Berry Engineering Company, Chester, Pa., boiler feed control, &c.  
Trill Indicator Company, Corry, Pa., Triumph steam indicators and appliances.  
Schoen, Jackson & Co., Media, Pa., flexible tubing.  
Dixon Crucible Company, Jersey City, N. J., graphite lubricants.  
Strong Machinery & supply Company, New York, Rivalite metallic packing.  
Diamond Specialty Company, Detroit, Mich., soot blowers.

On Thursday afternoon the American Supply Men's Association held its annual meeting and elected officers to serve for the ensuing year, as follows: President, Richard Foley, Home Rubber Company, Trenton, N. J.; vice-president, Harry Crouder, Crandall Packing Company, Philadelphia; treasurer, John Armour; secretary, Frederick John, *Power and Engineer*; director of exhibits, A. G. McConnoughy. Executive Committee: Frank Martin, Jenkins Bros.; Harry Sauder, John Livezey; Chas. P. E. Sanville, McArdle & Cooney Company; H. Rittenhouse, Quaker City Rubber Company; H. H. Krauth, Peerless Rubber Company; F. B. Stein, H. W. Johns-Manville Company; H. Wimer, Garlock Packing Company, and Charles Hopper, Keystone Lubricator Company.

At the closing session of the Supreme Council of the American Order of Steam Engineers it was decided to hold the twenty-fifth annual convention in Philadelphia in the first week in June, 1911, the Supply Men's Association concurring in this selection. Harry E. Souder was director of the exhibits, and for his successful management was warmly congratulated.

### Co-operative Engineering Courses at Pittsburgh

The trustees of the University of Pittsburgh have adopted a plan of co-operation with local engineering industries as recommended by the Committee on School of Engineering. It will be put into operation October 1, 1910. Under this plan the student while spending in school the amount of time usually devoted to instruction in engineering institutions will work three months of each year in some engineering industry in the Pittsburgh district. Thus in connection with the four years' course the student will obtain 12 months of practical experience. While taking this mill or shop work he will be considered a direct employee of the company for whom he works and will receive the regular wages of a student apprentice. When so employed the student will report to the proper instructor at the university one evening each alternate week for discussion of the work he is doing, and at the end of the term he will receive 20 credits when a written report of his work and observations in the three months has been received and accepted by the instructor in charge.

Furnace C, now being built by the Youngstown Sheet & Tube Company, Youngstown, Ohio, is expected to be ready for blast about August 1. The furnace was designed by Julian Kennedy, Pittsburgh, and all the iron work is being erected by the William B. Pollock Company, Youngstown. This stack will give the Youngstown Sheet & Tube Company a total of three furnaces, with an average daily output of about 1500 tons of Bessemer iron, all of which is used in its own steel plant.

## German Aerostat-Destroying Guns

### Krupp Products for Fighting Aerial Foes

BY MAX A. R. BRÜNNER, BERLIN, GERMANY

Germany has long been noted for the production of implements of warfare and, with the development of aeronautics, special attention has been paid by manufacturers in that country to the making of guns to destroy the airships of other nations. As far back as

at the desired spot at a moment's notice. As it is said that all guns heretofore placed on the market did not fulfill these requirements, these new models are worthy of attention. The smallest is a 6.5 cm. (2½ in.) caliber gun mounted on a two-wheel carriage, which may be carried on the platform of a power wagon, pushed by it or drawn by horses as part of an artillery train. A special feature is that the wheels can turn through an arc of 180 degrees, which enables short turns to be made, and the axle is similar to the front one of an automobile, as may be easily noticed from Fig. 2. Compressed air is employed to force the barrel out, and a brake acting through a liquid absorbs the shock of the recoil. The proper elevation of the gun is secured by a segmental rack and pinion. The gun barrel weighs 352 kg. (775 lb.); the carriage, 523 kg. (1132 lb.), and the complete gun, 875 kg. (1930 lb.). With a projectile weighing 4 kg. (8.82 lb.), the gun has a range of 8850 m. (5½ miles), and can throw the shot to a vertical height of 5700 m. (3.54 miles).

The model shown in Fig. 1 is mounted on an open power wagon driven by a 50-hp. engine transmitting power to all four wheels. In this way

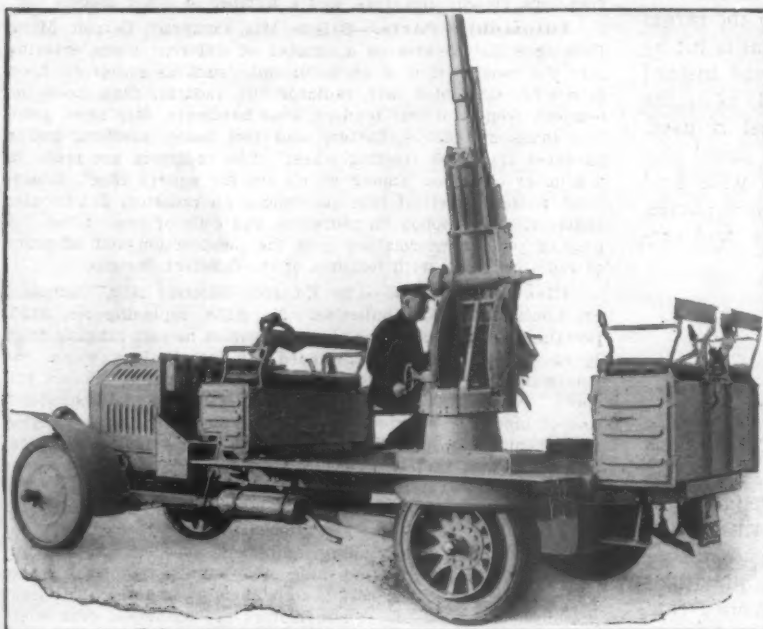


Fig. 1.—Automobile Artillery.

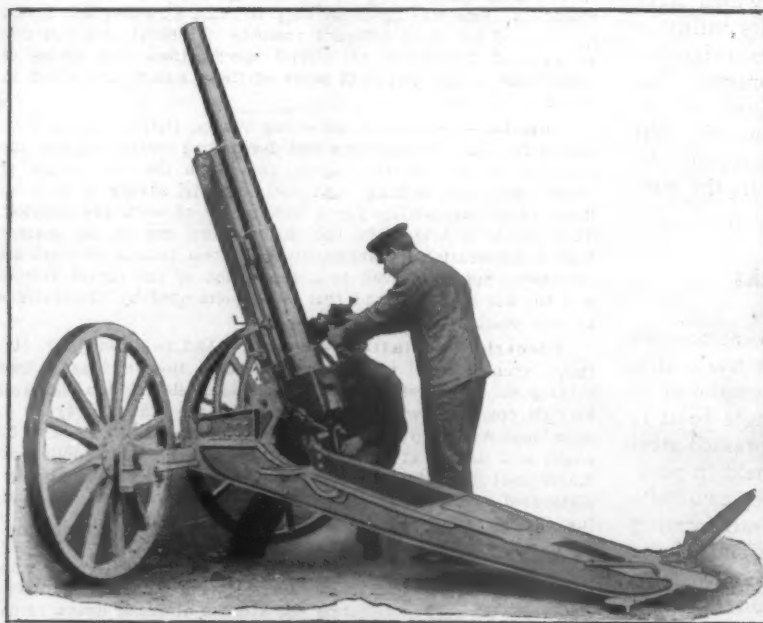


Fig. 2.—A Lighter Field Piece.  
Artillery for Destroying Overhead Enemies, Built at the Krupp Works, Essen, Germany.

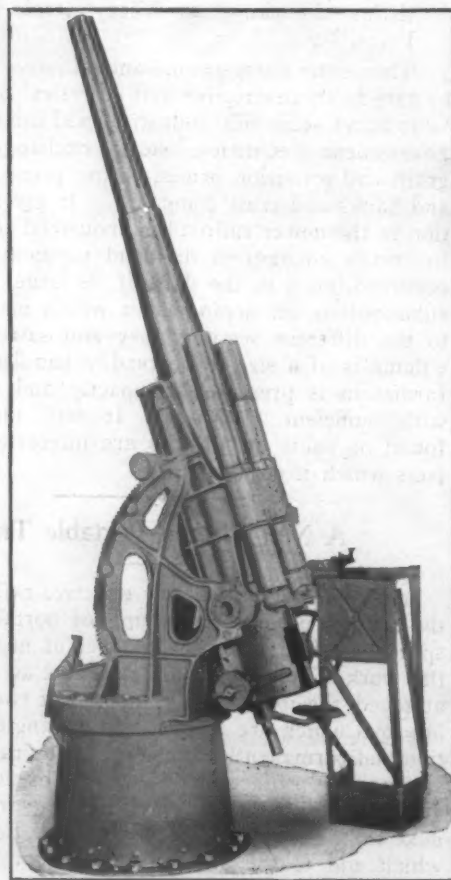


Fig. 3.—A Gun for Shipboard.  
Built at the Krupp Works, Essen, Germany.

1870 during the Franco-Prussian War, the German army used special cannon for shooting at the balloons sent out by the beleaguered city of Paris. More recently the Krupp plant at Essen has perfected three new models which are illustrated herewith. Fig. 1 is the model designed for mounting on the chassis of an automobile, Fig. 2 shows a type of horse drawn gun and Fig. 3 illustrates a gun intended for shipboard use.

A gun to destroy an airship effectively must possess certain features, among which are an unlimited range of action in the vertical plane, a high operating speed, a very short time of projectile flight, and ability to hit the mark with the first shot, and have the gun

the gun can be transported over uneven ground or up steep grades, while on level ground a speed of 72 miles per hour has been attained. The gun alone weighs 1065 kg. (2550 lb.), and the total weight of the car and gun is 3250 kg. (7165 lb.). The horizontal range of the gun is 9100 m. (5.65 miles), and the greatest height attained is 6300 m. (3.92 miles). The bore of the gun barrel is 7.5 cm. (2 61-64 in.), and an air compressor is provided to control the movement of the barrel. All four wheels are fitted with rubber tires, while the front ones are steel disks without any spokes. The platform will accommodate five men and 62 cartridges. The gun is mounted on a cast steel pedestal, and provision



is made for turning it completely around as well as moving it up and down.

The largest gun is that illustrated in Fig. 3, which is intended for marine and coast defense use. The caliber is 10.5 cm. (4 9-64 in.), and the vertical and horizontal ranges are 11,400 m. (7.09 miles) and 13,500 m. (8.4 miles), respectively. The barrel weighs 1400 kg. (3090 lb.), and the complete gun 3000 kg. (6613 lb.). The projectile has a muzzle velocity of 700 m. (1920 ft.), and its weight is 18 kg. (40 lb.). These shells contain two burners, one of which becomes ignited upon leaving the gun, and leaves a trail of black smoke behind it to mark the path of its flight and indicate whether the shot was too high or too low. The other is ignited by the impact of hitting the target and explodes the gas. Thus when an aerostat is hit by one of these shells it is completely destroyed instead of having the cover only slightly damaged, as is the case where an ordinary gun with shrapnel is used. The principal advantages claimed for this novel gun are a great number of shots per minute, a wide field of operation in both the vertical and horizontal planes, ability to move quickly from place to place, and certainty of aim.

## New Publications

**The Manual of Statistics.** Size, 5½ x 8 in.; pages, 1086; cloth bound. Publisher, the Manual of Statistics Company, 20 Vesey street, New York. Price, \$5.

This is the thirty-second annual issue, brought down to date in its descriptive and statistical details relative to railroad securities, industrial and mining securities, government securities, stock exchange quotations, grain and provision prices, cotton prices, money rates and banks and trust companies. It gives much attention to the newer railroad or industrial companies, and the many changes in dividend payments which have occurred down to the date of its issue. Its utility is enhanced by an arrangement which makes reference to the different sections easy and satisfactory. The volume is of a size to be readily handled, and the information is presented compactly and concisely, but with sufficient clearness. It will undoubtedly be found of value by all who are interested in the subjects which it covers.

## A New Idea in Portable Tracks

A simple yet remarkably effective rail joint now on the market permits the laying of portable track at a speed only limited by the number of men employed at the work. To one end of each rail an angle joint is attached, the joint being composed of two pressed steel brackets which are formed into an angle held in position and permanently connected to the rail by two bolts so that they project beyond the end of the rail forming a socket. Into this socket is put the free end of the next rail. The rail is secured to the tie by two bolts which add to the strength of the joint and prevent loosening or loss of any parts when the whole track is being shifted. The operation much resembles putting together a jointed fishing rod, from which fact can be gained an idea of the rapid work possible. If at any time a permanent track is desired the addition of a third bolt to each section is all that is required.

From the foregoing description it will be seen that one man alone can lay a track almost as quickly as three men could lay the necessary ties in other portable track systems. In construction work, in which time is usually the essence of the contract, the use of the track assures an important increase in the amount of work done. On many big jobs, which usually employ heavy permanent tracks, this type is used as an auxiliary equipment, saving much valuable time and re-

quiring but few men to handle it. The Orenstein-Arthur Koppel Company, Pittsburgh, Pa., which makes this track, reports a large demand for the new rail.

## Trade Publications

**Conveying Machinery.**—The Jeffrey Mfg. Company, Columbus, Ohio. Booklet No. 38. Calls attention to the general character of the machinery manufactured by this company and its wide range of application. The different lines illustrated are the Jeffrey storage battery locomotive, coal and ash handling equipment for boiler rooms, grab bucket coaling systems, rubber belt conveyors, log hauls, wire cable conveyor systems, lumber transfers, freight elevators, and a number of other models.

**Automobile Parts.**—Briscoe Mfg. Company, Detroit, Mich. Catalogue G. Relates to a number of different parts entering into the construction of an automobile, such as radiators, hood fronts for air cooled cars, radiator fins, radiator fans, hoods or bonnets, front and rear fenders, hood hardware, drip pans, gasoline tanks and fillers, battery and tool boxes, mufflers, and a patented steel web steering wheel. The radiators are made in a number of styles, among which are the square effect, honey-comb pattern, vertical tube continuous fin radiator, flat tubular radiator, spiral ribbon fin radiators, and coils of small tubes. A page of general information upon the construction and efficiency of radiators deals with features of the different designs.

**Electric Motors.**—The Emerson Electric Mfg. Company, St. Louis, Mo. Four bulletins. No. 3138, replacing No. 3125, pertains to a line of single-phase induction motors ranging from ¼ to ½ hp., which are designed for installations where the maximum load is not thrown on the motor until it reaches full speed. No. 3217, replacing No. 3211, describes and illustrates a line of bipolar ventilated direct-current motors in sizes ranging from 1-20 to ¼ hp. These motors are well suited for general service, and as they are very compact can be used in locations where space is valuable, for operating small machines, and office devices. No. 3707, replacing No. 3706, describes an electric buffing lathe for use with either alternating or direct current for polishing, buffing and grinding light work, especially well adapted for jewelers and for polishing silver and plated ware where a large amount of such work is to be done but where only a light pressure need be used. These motors are furnished completely inclosed, with all working parts protected from flying dust and dirt. No. 3962, replacing No. 3958, lists a line of motors for operating rotary washing machines originally designed for hand operation. One size of motor only is built, 1-10 hp., but it can be obtained for three different numbers of alternations and two voltages of direct current. Brief specifications and tables of dimensions of the principal parts of these motors are given in all the bulletins.

**Cupola.**—Northern Engineering Works, Detroit, Mich. Catalogue No. 51. Illustrations and descriptive matter explain the operation of the Newton cupola, for which the advantages of rapid continuous melting, high fuel economy, saving in wear on lining, and adaptability for a wide range of work are claimed. This cupola is said to be the only modern one on the market with a differential adjustable tuyere system and an all-steel air chamber. Space is given to a description of the tuyere system and the air chamber, and this is supplemented by illustrations of both features.

**Electric Specialties.**—Pettingell-Andrews Company, Atlantic avenue, Pearl and Purchase streets, Boston, Mass. Two catalogues. The first deals with the line of electric fans handled by this company, which includes all of the standard types of prominent American manufacturers. The second is a book of 52 pages and lists a great variety of articles for automobile and motor boat use. All of these are given brief descriptions, supplemented by illustrations. A complete index renders the finding of any desired article comparatively simple.

**Road Surfacing.**—Barrett Mfg. Company, New York City. Pamphlet. Concerned with Tarvia and its application to macadam, slag and gravel roads for securing dustless highways which are capable of resisting the attacks of frost, heavy rains, drought and motor vehicles. This preparation comes in three different grades, Tarvia A, Tarvia B and Tarvia X, which are suitable for road maintenance, dust suppression and road construction, respectively.

**Cast Gears.**—Philadelphia Roll & Machine Company, Twenty-third street and Washington avenue, Philadelphia. Folder, illustrating pattern molded cast gears. The gears made by this company are cast from a mixture of charcoal air furnace iron, finished with the accuracy that insures easy running qualities and long wear.

The population of Australia on December 31, 1909, was 4,374,129, distributed as follows: New South Wales, 1,621,677; Victoria, 1,303,357; Queensland, 572,654; South Australia, 416,047; West Australia, 273,534; Tasmania, 186,860.

S. DIESCHER & SONS.  
Mechanical and Civil Engineers  
Pittsburgh, Pa.

## The Personal Equation In Accidents\*

### Responsibility of Employees Should Be Emphasized

BY THOMAS D. WEST, CLEVELAND, OHIO.

Recently the Minnesota Employers' Association and the Federation of Labor jointly petitioned the Governor of that State, asking an investigation by the Legislature looking toward a change in the present system of compensation of employees in case of accident, in which the element of risk of the industry is recognized. Among the 16 clauses, we find the following statement: "We are convinced that the majority of accidents that happen in the course of employment occur by reason of dangers incident to the employment and without fault upon the part of either employer or employees."

The document in question is noteworthy, as it shows a commendable spirit of fairness between employer and employee, but the question arises whether the proper basis has been chosen to work upon. Is not perhaps the fact that when a trade is designated as dangerous it is made more so by such official action, for things may be encouraged that can have a direct influence on causing accidents? Far better if attention is directed toward increased watchfulness, the exercise of sound judgment and fidelity to duty; for while it is commendable to give adequate compensation for injuries received, great care should be taken that a state of affairs is not created tending to increase accidents. How seldom is even a reasonable compensation sufficient to atone for the suffering that results, especially if the outcome is fatal.

From the experience of the writer, both as employee and employer, and his investigations along the lines of accidents, their causes and remedies, he is certain that any unbiased and thorough investigation will show that the great majority of accidents is the result of personal carelessness chargeable directly to the individual, to lack of obedience to instructions, error in judgment or neglect of duty. An excellent authority on railroad accidents, James O. Fagan, on page 52 of his valuable book, "Confessions of a Railroad Signaller," says that fully 85 per cent. of the fatalities that occur on railroads can be directly traced to the negligence of employees. What holds good in one industry, so far as accidents are concerned, is often applicable to all the others.

#### Responsibility Should be Fixed

As this is a matter that we have all to face squarely at any hour, we might as well have the truth. We are continually liable to be killed or maimed, and it is not assuring to see all the dodging that is being done in handling the question of responsibility at the present day.

To advance the view that the majority of accidents in a trade are incident to it, and that neither the employee nor employer is at fault, is likely to have serious results, for it takes away most of the sense of personal responsibility from the operative and makes him heedless regarding the effect of his actions upon the safety of others. We are daily killing and maiming 1600 persons in this country. If the idea of the nonresponsibility of the person in the majority of accidents is to prevail, suppose we try to answer the following questions satisfactorily to ourselves:

1. Is it possible so to equip our street cars that careless motormen cannot run over people?
2. Is it possible to so install signal systems that the personal element of the train dispatcher can be wholly ignored?

3. Is it possible for an engineer to disregard instructions at will and yet always bring in his train safely?

4. Can the judgment of the wheel tester be dispensed with and chances taken in sending out trains under any methods we know of, eliminating the man?

5. Is there any way by which the responsibility of the pilot at sea can be done away with?

6. Can the elevator operator have his mind on foreign topics, and not some time or other injure his passengers?

7. Is there any way, except through his own watchfulness, that one can cross busy streets without running grave chances?

8. In running automobiles is there any way of avoiding accidents to self and others, except by the strictest attention and cool judgment?

9. In handling guns, powder and fireworks, will anything but sane judgment prevent accidents, which on the Fourth of July alone in this country cause 5000 deaths and serious injuries?

10. Is there any automatic way of preventing conflagrations due to lighting matches carelessly? If so, we could save something like fifty millions annually and many lives.

11. Is there any rule by which an operative will always take the proper sized chain to make a safe lift, or attach the tackle properly, erect poles, move loads and the like?

12. Can the crane operator be inattentive occasionally and yet not injure some one?

13. In the firing of boilers, handling of safety valves, speeding of machines, even the selecting of proper threads for bolts, can we do without the intelligence of the workman or his proper judgment?

14. Regarding the use of electricity, safety lamps, explosives, &c., is it not a fact that many mine disasters are the result of deliberate carelessness on the part of some one man, who thus is the cause of death and disaster to many others?

Many more questions could be put, covering a still wider range of observation, such as liability to accident from drinking, smoking, stupidity, deliberate inattention and horseplay. At the very time of penning these lines, the writer was summoned to the spot where a fine young man was killed as the result of skylarking with a companion, trying to pull away a small belt from him, one being over a smooth shaft, while the other on the ground. For the foundry, in particular, we have the careless use of water, hard ramming, poor venting and drying of cores and molds, bad joints, poor flasks, improper clamping and weighing of molds, and badly daubed, dried and handled ladles.

#### The Employer's Part in Accident Prevention

The writer by no means wishes to screen the employer who does not do his part in helping to prevent accidents. It is the best kind of a policy to furnish all practicable safety devices and to instill into the minds of the operatives a sense of caution and forethought. There is no denying the fact that the employer or foreman, by watching out for those carelessly inclined, may do much toward preventing them from damaging themselves and others. Of course this means an added load of worry, but inasmuch as accidents with their attendant suits and judgments jeopardize investment, this load had better be assumed as an insurance.

Attention must be called to the tendency on the part of employees to run things to their entire liking, if allowed, and the consequent increase in the accidents of a shop where this condition of affairs exists. As an example of this, we have large establishments in which the men bring in intoxicants in open buckets right past the watchmen and the officials, to consume them when and where they please within the works. This is surely a direct bid for accidents.

Prevention of accidents by the removal of all the

\* Read at the convention of the American Foundrymen's Association, Detroit, Mich., June 7, 1910.



factors that tend to cause them should be our watchword. Nor should we hesitate to point our fingers to the proper places for fear of censure. An honest effort is needed on the part of both employers and employees to remedy individual faults; by so doing we would cut down 80 per cent. of the accidents in shops. Let this be accomplished, and the question of compensation will largely take care of itself, and much of the misery and sorrow we see daily would be saved.

The operative must be taught that his part is very important in the removal of liability to accidents, and that the doctrine that accidents are to be expected in certain industries, irrespective of the conduct of either employer or employee, is a grave and dangerous fallacy.

### The Standard Screw Company

The annual report of the Standard Screw Company, covering operations for the fiscal year ended March 31, 1910, shows the following income account:

Net profit, after deducting depreciation and expenses, \$454,553.91  
From which deduct:

Bond interest.....	\$26,200.00
Interest on borrowed money.....	7,776.77
Discount, brokerage, &c., on debentures sold .....	40,195.15
	<u>74,171.92</u>

Net income available for dividends.....\$380,381.99  
Less dividends paid—6 per cent. on preferred and 6 per cent. on common.....269,814.00

Surplus.....\$110,567.99

The balance sheet, as of March 31, is as follows:

Assets.	
Cost of properties, less depreciation.....	\$4,023,814.38
Stock in treasury.....	68,160.17
Interest, insurance and taxes paid in advance.....	7,589.41
Finished and partly finished product, materials and supplies .....	779,542.62
Accounts and notes receivable.....	468,235.00
Cash .....	163,602.61
Total.....	<u>\$6,410,944.19</u>

Liabilities.	
Preferred stock.....	\$2,000,000.00
Common stock.....	2,500,000.00
Five per cent. debenture bonds—payable \$30,000 each six months beginning April 1, 1911.....	600,000.00
Notes payable.....	266,000.00
Accounts payable.....	234,047.12
Surplus.....	810,897.07
Total.....	<u>\$6,410,944.19</u>

President W. B. Pearson makes the following accompanying remarks: "In my last report I noted the fact that business was improving. I am now able to report that the improvement continued and in such a substantial manner that your directors decided it was necessary to provide for the increase by substantial additions to the plants at Hartford, Detroit and Chicago. To provide funds for this purpose, to supply additional working capital (necessitated by the increased volume of business) and to take up the outstanding \$224,000 of debentures maturing April 1, 1910, your directors decided on the advisability of issuing \$600,000 of 5 per cent. debentures maturing serially and payable at the rate of \$30,000 every six month, beginning April 1, 1911. These debentures have been issued and sold, the old debentures retired and the improvements practically completed. The results will soon be apparent. The returns from operation have been sufficient, in the opinion of your directors, to warrant us in setting up a substantial reserve for depreciation."

The general offices of the company are at 6 East Madison street, Chicago. The properties owned are as follows: Chicago Screw Company, Illinois Screw Company, Western Automatic Machine Screw Company, Worcester Machine Screw Company, Hartford Machine Screw Company, Walker and Ehrman Mfg. Company, Pearson Machine Company and Detroit Screw Works.

## Chemistry and Cupola Practice\*

### The Combined Carbon Content of Machinery Castings

BY W. W. COX.†

There are certain characteristics which iron coming from a cupola must have in order to make castings that are solid, that are capable of being easily machined and that possess average tensile strength; in other words, satisfactory castings. Since the advent of coke iron in the foundries it has been shown by practical usage that the ordinary foundry mixture usually produces an iron strong enough for ordinary purposes if the mixture has been properly melted in the cupola, if it contains the correct proportion of metalloids within rather wide limits and if it is cast at the right temperature.

It is perhaps a broad assertion, that if a casting is solid and easy to machine, it has tensile strength enough for ordinary machinery castings; yet there are few records of castings that have failed in service that have not shown some flaw or defect which accounted for the failure. It is a metallurgical fact that, if castings are solid and contain normal percentages of the elements usually present in the iron, the castings will have tensile strength enough for ordinary use; say, 20,000 lb. per sq. in. (It must not be inferred that it is not possible to produce castings of much higher strength by proper mixing and melting of irons capable of producing it.

The ordinary problem, therefore, before the foundry chemist is to produce sound castings that can be easily machined. In a casting of this character, the carbon must be largely in the graphitic state, or rather, the per cent. of combined carbon should be 0.50 per cent. or lower, as the facility with which cast iron can be cut or machined depends entirely upon the amount of combined carbon in it. Following are the averages of a series of test bars drilled with Keep's hardness machine, which shows the number of revolutions of a standard  $\frac{3}{8}$  in. drill required to penetrate the 1 in. x 1 in. test bars, the drillings from which were afterwards used for making the carbon determination:

	Combined			Combined	
	No. revo- lutions.	Per cent.		No. revo- lutions.	Per cent.
1.....	569	0.51	4.....	275	0.13
2.....	844	0.76	5.....	451	0.48
3.....	413	0.41	6.....	363	0.18

#### Combined Carbon and Easy Machining

As all machinery castings are machined, it is evident that the combined carbon should be kept at a minimum. The question arises, if the combined carbon is low, say 0.15 per cent., would not the tensile strength be impaired? This might be answered by saying that the per cent. of combined carbon (or just carbon, for it is all combined) in wrought iron is nearly always below that amount, while the tensile strength is always greater than in ordinary cast iron.

Graphite, of course, is a weakening element, and if separated in the metal in sufficient quantity to accumulate as "kish," would reduce the tensile strength to practically nothing. Nevertheless a very small quantity of combined carbon serves to give strength to the casting as shown by the following analysis of pig iron, which has the highest tensile strength of any iron produced in the United States:

Gr.	C. C.	Si.	Sul.	Mn.	P.
2.55	0.155	0.78	0.027	0.505	0.244

Castings having combined carbon 1 per cent. and over, are not only hard to cut but are brittle and are apt to be unsound. In order to produce good machinery

\* A paper read before the Kansas City, Mo., branch of the American Chemical Society, May 21, 1910.

† Chemist and metallurgist, 11½ East Eighteenth street, Kansas City, Mo.

castings with an average thickness of, say, 1½ in., the chemist should mix and melt iron producing an analysis of:

Gr.	C. C.	Si.	Sul.	Mn.	P.
2.60	0.50	2.00		Over	Below
or	or	to	0.100	0.40	1.00
less.	less.	2.30			

In mixtures in which steel scrap is an ingredient, called semisteel, the metalloids would be reduced as the percentage of steel is increased. The carbon is not reduced proportionately, however, as the metal absorbs more or less carbon from the fuel, depending upon whether it was melted in a neutral or oxidizing atmosphere in the cupola. Neither is manganese reduced in proportion, as ferromanganese has to be added to diminish the sulphur (for which this kind of a mixture has a strong affinity) and to keep the carbon in the graphitic form in the casting. This, however, is not a discussion of semisteel.

The above analysis represents what the old-fashioned foundrymen make occasionally and what the foundry chemist should make continuously, or nearly so, for machinery castings of a certain section.

#### Variations in Heats from the Same Mixture

An example of the variations in cupola practice and the results obtained, are shown in the following four heats which were made in the same cupola, and with the same mixture and blast pressure. From the first, middle and last of each heat was cast a 1 in. x 1 in. test bar from which the analyses were made:

Heat No. 1.					
Gr.	C. C.	Si.	Sul.	Mn.	P.
First bar.....2.54	0.52	2.00	0.103	0.45	...
Middle bar.....2.18	0.80	2.05	0.128	0.37	0.95
Last bar.....1.70	1.23	1.97	0.196	0.34	...

The iron was hot at first and cold at the end of the heat. The castings from the beginning of the heat were strong, sound and easy to cut. Those from the middle of the heat were not so good and the castings from the end of the heat were brittle, spongy and hard to machine.

Heat No. 2.					
Gr.	C. C.	Si.	Sul.	Mn.	P.
First bar.....1.67	1.28	2.05	0.136	0.35	...
Middle bar.....2.65	0.52	2.10	0.105	0.45	0.92
Last bar.....2.78	0.42	2.10	0.109	0.45	...

The iron was hot but melted slowly toward the end of the heat. The castings from the first part of this heat were hard and brittle while those from the middle and last of the heat were of good quality.

Heat No. 3.					
Gr.	C. C.	Si.	Sul.	Mn.	P.
First bar.....2.41	0.71	2.01	0.118	0.41	...
Middle bar.....2.40	0.72	2.00	0.119	0.42	0.90
Last bar.....2.44	0.70	2.02	0.105	0.40	...

In this case the iron melted rapidly throughout the heat but was not very hot. The resulting castings were neither soft nor very strong.

Heat No. 4.					
Gr.	C. C.	Si.	Sul.	Mn.	P.
First bar.....3.10	0.42	2.27	0.102	0.56	...
Middle bar.....2.85	0.38	2.18	0.117	0.52	0.92
Last bar.....2.70	0.42	2.13	0.115	0.45	...

This iron melted rapidly and was hot throughout the heat. The castings were strong, free from defects and easy to machine.

#### The Variations Explained

The explanation of these wide variations in the chemical analyses and physical properties of the castings produced from the same iron mixture lies in the fact that the iron was melted at different levels in the cupola. It was Edward Kirk who found by experiment that iron can be melted properly only in a certain part or zone in the cupola; that the zone is usually about 8 in. in depth and that the height of this melting zone above the tuyeres depends upon the velocity of the blast.

In the case of Heat No. 1, the bed coke was 34 in.

above the tuyeres when the first iron was charged and the fuel between the charges was not sufficient to replenish the bed as it burned away, consequently the bed kept getting lower and lower throughout the heat. The first iron was melted in the center of the melting zone and the last iron was melted in the lower edge of the zone where it was hardened by the oxidizing atmosphere.

In Heat No. 2 the bed was 50 in. above the tuyeres when the first iron was charged. This excess of coke had to be burned away in order to allow the iron to descend to the point where it could be melted, the iron meanwhile being heated to a high temperature for a considerable period and burned much as a grate bar is burned. A grate bar when remelted shows high combined carbon. The remainder of this heat was melted at the proper height in the cupola; not being slagged and containing an excess of coke ash, it melted slowly.

Heat No. 3 is an illustration of false economy in coke. The iron was melted low in the zone throughout the heat, the bed being 12 in. above the tuyeres when the first iron was charged and enough fuel was used between the charges to maintain that height during the heat.

The last case, Heat No. 4, shows the mixture melted at the center of the melting zone during the entire heat, with a 34 in. bed and a melting ratio of 1 to 8½ for the charges; it yields the maximum strength, softness, soundness and uniformity that the mixture is capable of producing.

#### American Brake Shoe & Foundry Company Finances

In its application to list its stock on the New York Stock Exchange, the American Brake Shoe & Foundry Company agrees not to dispose of its interest in any constituent company or allow any of said companies to dispose of its interests in other companies except on direct authorization of the stockholders. Following the authorization to increase the stock to \$10,000,000, consisting of \$5,000,000 preferred and \$5,000,000 common, \$1,000,000 preferred was issued at 102½ to stockholders and \$1,000,000 common issued in part payment for two foundry plants at Melrose Park and Burnside, Ill. The capital outstanding is \$4,000,000 preferred and \$3,600,000 common. The company reports for the year ended September 30, 1909:

Gross earnings.....	\$4,039,873
Net earnings.....	875,772
Surplus after charges.....	833,651
Dividends.....	326,000
Surplus.....	507,651
Total surplus.....	2,021,679
The income account for six months ended March 31, 1910, is as follows:	
Gross Income.....	\$2,654,581
Net earnings.....	568,361
Net after charges.....	547,561
Dividends paid.....	181,750
Surplus.....	365,811
Surplus March 31, 1910.....	\$2,387,491

One of the two battleships authorized by the naval appropriations bill must be built at the Brooklyn Navy Yard. This was determined June 10, when the House accepted a Senate amendment to that bill providing that one of these ships must be built by the Government and not by private contractors. The Brooklyn yard is the only Government yard adequately equipped to do the work.

After municipal ownership for a quarter of a century, the city of Goshen, Ind., is planning to abandon its city lighting plant and buy its light and power from the Hawks Electric Company, which owns three plants and is building a fourth.



## Specifications for Foundry Coke\*

BY DR. RICHARD MOLDENKE, WATCHUNG, N. J.

The subject of specifications for foundry coke has been long agitated, but very little so far has been accomplished; and this probably because we have been going through just such a change in practice in our coke as we have in our pig irons ever since more liberal and yet more exact views have prevailed. The appearance of a coke no longer carries the weight it formerly did, and all that is now asked is that it melts iron properly, and has a composition to do this without serious detriment to the metal. This change in practice has undoubtedly been the result of the educational efforts of the by-product coke manufacturers, and as it has meant the saving of much money formerly spent in freights the foundry industry has been the gainer in every direction on the coke item.

There is still much to be learned by the foundryman regarding the fuel he uses for melting purposes. Too often the blame for poor results is placed on the coke, when the real trouble lies in his melting practice. So that there may be no doubt about the fuel end, it is highly advisable that a good and yet liberal set of specifications for foundry coke be drawn up so that coke bought under them may assure the foundryman reasonable safety. If then he runs into trouble he will have eliminated the coke from his study of the difficulty.

### Furnace Coke and Foundry Coke

There are many points which have a bearing on the value of a coke and yet cannot well be added to such specifications. Thus, the cellular structure is an important factor on the working of the coke in the cupola. It must be remembered that in contradistinction to blast furnace practice, where there is a reducing atmosphere, in the cupola it is oxidizing. In the blast furnace the cellular structure of the coke should be as great as possible, so that every molecule of oxygen is used up in burning the carbon, and with an excess of incandescent carbon make carbonic oxide gas. This means that the lighter the coke, consistent with its carrying power, and the more porous, the better.

On the other hand, for foundry purposes it is desirable that coke be burned with a slight excess of oxygen, as in boiler practice, so that as complete a combustion of the fuel as possible may result. That is, the gas should be carbonic acid, with but little carbonic oxide. This can best be accomplished by presenting smaller surfaces to the passing oxygen. For that reason the smooth surfaces of anthracite, with no cellular structure whatever, give a most excellent fuel for the cupola, though coke can be burned faster.

Considering average coke to be 50 per cent. cellular structure, the blast furnace can take care of higher percentages, while the cupola should have them lower. Very light cokes are therefore to be avoided, and rather the denser, heavier ones—provided the weight does not come from an excess of ash—are to be recommended.

On the question of sulphur, we have still something to learn. As between the volatile sulphur and that fixed in the ash of coke, we do not yet know positively why sometimes with the latter we get more into our castings and at other times proportionately less. We know that temperatures and slag conditions have much to do with this; but until we are more certain, a differentiation of the sulphur content of a coke is not yet safe, the idea being that the dangerous portion of the sulphur only need be kept down.

Further, there is no doubt that we will eventually have some means of reducing the sulphur in our molten

iron before pouring, and then sulphur in coke will lose some of its terrors.

In presenting suggested specifications for foundry coke, the following acknowledgments are made. The limits in composition and the base analysis are suggested by A. W. Belden, coke expert of the United State Geological Survey. They are the result of his extended observation with cokes from all the fields of this country. The portion relating to the shatter test comes from the regular practice of the Detroit Solvay coke plant, Warren S. Blauvelt having kindly sent the writer the specifications on this point.

Premiums for extra good coke as against penalties for running below the mark have long been advocated by the writer as the only fair way of handling the subject. So long as the limit for rejection is placed at a point which will do no injustice to the producer, he will study to get the best results so that he not only gains financially, but also acquires a reputation for it. Penalizing without giving corresponding premiums for special excellence has always been held as against fundamental law, and where the base analysis has been settled upon, and safe physical tests added to the chemical, the results should be good for consumer and producer alike.

### Suggested Specifications for Foundry Coke

Coke bought under these specifications should be massive, in large pieces and as free as possible from black ends and cinders.

#### SAMPLING.

Each carload or its equivalent shall be considered as a unit, and sampled by taking from the exposed surface at least one piece for each ton, and so as to fairly represent the shipment. These samples, properly broken down and ground to the fineness of coarse sawdust, well mixed and dried before analysis, shall be used as a basis for the payment of the shipment. In case of disagreement between buyer and seller an independent chemist, mutually agreed upon, shall be employed to sample and analyze the coke, the cost to be borne by the party at fault.

#### BASE ANALYSIS.

The following analysis, representing an average grade of foundry coke capable of being made in any of the districts supplying foundries, shall be considered the base, premiums and penalties to be calculated thereon as determined by the analysis on an agreed base price:

Volatile matter.....	1.00	Ash .....	12.00
Fixed carbon.....	85.50	Sulphur .....	1.10

#### PENALTIES AND BONUSES.

**Moisture.**—Payment shall be made on shipments on the basis of "dry coke." The weight received shall, therefore, be corrected by deducting the water contained. (Note.—Coke producers should add sufficient coke to their tonnage shipments to make up for the water included, as shown by their own determinations.)

**Volatile Matter.**—For every 0.50 or fraction thereof, above the 1.00 allowed, deduct .. cents from the price. Over 2.50 rejects the shipment at the option of the purchaser.

**Fixed Carbon.**—For every 1.00 or fraction thereof, above 85.50 add, and for every 1.00 or fraction thereof below 85.50, deduct .. cents. Below 78.50 rejects the shipment at the option of the purchaser.

**Ash.**—For every 0.50 or fraction thereof below 12.00, add, and for every 0.50 or fraction thereof above 12.00, deduct .. cents from the price. Above 15.00 rejects the shipment at the option of the purchaser.

**Sulphur.**—For every 0.10 or fraction thereof below 1.10 add, and for every 0.10 or fraction thereof above, deduct .. cents from the price. Above 1.30 rejects the shipment at the option of the purchaser.

#### SHATTER TEST.

On arrival of the shipment the coke shall be subjected to a shatter test, as described below. The percentage of fine coke thus determined, above 5 per cent. of the coke, shall be deducted from the amount of coke to be paid for (after allowing for the water), and paid at fine coke prices previously agreed upon. Above 25 per cent. fine coke rejects the shipment at the option of the purchaser. Fine coke shall be coke that passes through a wire screen with square holes 2 in. in the clear.

The apparatus for making the shatter test should be a box capable of holding at least 100 lb. coke, supported with the bottom 6 ft. above a cast iron plate. The doors on the bottom of the box shall be so hinged and latched that they will swing freely away when opened, and will not impede

\* Read at the Detroit meeting of the American Foundrymen's Association, June 9, 1910.

the fall of the coke. Boards shall be put around the cast iron plate so that no coke may be lost.

A sample of approximately 50 lb. is taken at random from the car, using a 1¼ in. tine fork, and placed in the box without attempt to arrange it therein. The entire material shall be dropped four times upon the cast iron plate, the small material and the dust being returned with the large coke each time.

After the fourth drop the material is screened as above given, the screen to be in horizontal position, shaken once only, and no attempt made to put the small pieces through specially. The coke remaining shall be weighed and the percentage of the fine coke determined.

If the sum of the weights indicate a loss of over 1 per cent. the test shall be rejected and a new one made.

Rejection by reason of failure to pass the shatter test shall not take place until at least two check tests have been made.

## Street Railroad Development

### Electricity Now Forms 99 Per Cent. of the Motive Power

The remarkable development since 1902 of the industrial activities of the street and electric railroads of the United States is clearly seen in the statistics compiled by the Census Bureau from the census of such companies, taken in 1907, and presented in its second report, now on the eve of publication. The report was prepared under the supervision of William M. Steuart, chief statistician for manufactures of the census. T. Commerford Martin of New York City was the consulting expert special agent of the office and prepared the part dealing with the technical features of the industry. Division Chief William A. Hathaway prepared the analytical tables and text verification.

#### Universal Adoption of Electricity

In his letter transmitting the report to Secretary Nagel of the Department of Commerce and Labor, Census Director Durand states that the universal adoption of electricity as a motive power for street railroads and the extension of these roads into rural districts make it impracticable to separate the statistics of street railroads from those for the interurban railroads. The present report, therefore, like the one on the census of 1902, covers all roads using electrical energy as motive power, and also the street railroads operated by animal power, cable, gasoline motors and steam.

In 1907 the total number of miles of line, by which is meant length of first main track or roadbed, was 25,547.19, as compared with 16,645.34 in 1902, the per cent. of increase being 53.5. The total number of miles of track, meaning the total length of all trackage, including sidings, was 34,403.56 in 1907, as against 22,576.99 in 1902, the per cent. of increase amounting to 52.4. Of the total number of miles of track, those operated by electricity in 1907 numbered 34,059.69 and in 1902 21,907.59. The per cent. of increase was 55.5. The trackage operated by animal power in 1907 was 136.11 and in 1902 259.10. The per cent. of decrease amounted to 47.5. The trackage operated by cable in 1907 was 61.71 and in 1902 240.69, the per cent. of decrease being 74.4. The trackage operated by steam in 1907 was 146.05 and in 1902 169.61, a decrease of 13.9 per cent.

The percentage of total trackage operated by electric current increased from 15.5 in 1890 to 99 in 1907. Animal power was the most important in 1890, being in use on 69.7 per cent. of the total trackage. By 1907, however, the proportion of trackage operated by animal power had decreased to four-tenths of 1 per cent.

#### Great Increase in Cost

The cost of construction and equipment in 1907 was \$3,637,668,708, as compared with \$2,167,634,077 in 1902, the per cent. of increase amounting to 67.8.

The number of employees in 1907 was 221,449 and

in 1902 it was 140,769, the per cent. of increase being 57.3.

The total number of cars in use in 1907 was 83,641, as against 66,784 in 1902, an increase of 25.2 per cent. The number of passenger cars in 1907 was 70,016, as compared with 60,290 in 1902. The per cent. of increase was 16.1, this low rate of increase being due to the fact that the use of electricity has made it possible to increase the size of the passenger cars.

The total number of passengers in 1907 was 9,533,080,766, as against 5,836,615,296 in 1902, an increase of 63.3 per cent.

#### Other Power Than Electricity

The steam and gas engines and water wheels used in generating the electricity were reported as having 2,476,479 hp. in 1907, as compared with 1,349,211 in 1902, an increase of 1,127,268 hp., or 83.6 per cent.

The kilowatt capacity of dynamos in 1907 was 1,723,416 and in 1902 898,362, an increase of 91.8 per cent.

The gross income of the operating companies in 1907 was \$429,744,254 and in 1902 it was \$250,504,627, an increase of 71.6 per cent. The per cent. ratio of operating expenses to operating earnings in 1907 was 60.1 and in 1902 it was 57.5.

The total capitalization outstanding of the operating and lessor companies in 1907 was \$3,774,772,096, while in 1902 it was \$2,308,282,099, an increase of 63.5 per cent.

The contents of the report are in two parts. Part I. pertains to the statistical phase of the subject and Part II. concerns the technical side.

### Dominion Iron & Steel Company, Ltd.

The annual report of the Dominion Iron & Steel Company, Ltd., published in the past week shows that the net earnings for the year ending May 31, 1910, were \$2,735,591, against \$2,634,127 in the previous year. The surplus after deductions for depreciations and interest which were respectively \$498,101 and \$629,528, is \$1,607,960, against \$1,571,412 surplus at the end of the preceding year. Adding the previous surplus, \$2,099,801, and the amount received from the Dominion Coal Company, Ltd., not previously taken into account, \$333,796, gives a total of \$4,041,558. From this deductions are made of \$1,575,000 dividends on preferred stock, in arrears and paid, also regular 7 per cent. dividend of \$350,000 and \$58,330 reserved for preferred dividend payment, leaving a profit and loss surplus on May 31, 1910, of \$2,058,225.

The output for the year in gross tons was as follows: Pig Iron, 255,161; steel ingots, 302,118; steel rails, 146,967; wire rods, 81,581. The president, J. H. Plummer, says in his report to the stockholders that the earnings of the past year were affected by a deficiency in the supply of coal from the Dominion Coal Company, due to strikes, coal being purchased from other sources. There was also a decrease in the amount of bounties received.

**A New Open Hearth Steel Plant.**—The Galesburg Coulter-Disc Company, Galesburg, Ill., and Norwalk, Ohio, is arranging for the immediate erection of a basic open hearth steel plant, and will soon be ready to let contracts for the construction of the open hearth furnaces and steel building, also for the purchase of cranes, hammers, roll and shearing machinery, boilers, engines, &c.

The House of Representatives at Washington has passed bills authorizing the Gary Land Company, Gary, Ind., to build two bridges across the Grand Calumet River and the Inland Steel Company to build two bridges across the same river in Lake County, Ind.



## The History of the Rock Drill

### A Purely American Invention

BY W. L. SAUNDERS.

The rock drill is an American invention, conceived and developed in the United States. J. J. Couch of Philadelphia took out the first practical patents in 1849. In his experiments he was assisted by Joseph W. Fowle. The Couch drill was a crank and flywheel machine. Couch and Fowle separated in 1849, the latter filing a caveat in 1849 covering a drill of his own invention and describing the successful power rock drill substantially as it is to-day.

#### The Fowle Drill

The most important feature of Fowle's drill is that the cutting tool was attached directly to the piston. In other words, the steel leading into the hole was an extension of the drill piston rod. Fowle described this invention in his testimony before the Massachusetts legislative committee in his contest with Burleigh in 1874, as follows: "My first idea of ever driving a rock drill by direct action came about in this way: I was sitting in my office one day, after my business had failed, and, happening to take up an old steam cylinder, I unconsciously put it to my mouth and blew the rod in and out, using it to drive in some tacks with which a few circulars were fastened to the walls."

Abroad the nearest approach to rock drill invention was the work of the German, Schumann, carried on in 1854. Fowle being without means to develop his ideas, they remained in obscurity until Charles Burleigh purchased his patents and produced the Burleigh drill, about 1866. This drill was used in driving the Hoosac tunnel, in Massachusetts, in 1867. Following Couch, Fowle and Burleigh came Haupt, Wood, Ingersoll, Sergeant, Waring and Githens. Githens was the inventor of the Rand drill.

#### The Ingersoll Drill

The Ingersoll drill was invented in 1871. Simon Ingersoll, a modest, ingenious and honest mechanic, came to New York from Connecticut, bringing with him the models of several inventions. He was riding in a New York horsecar one day and was describing one of his inventions to a fellow passenger. Another passenger in the car was John D. Miner, who overheard Ingersoll's conversation. Miner was a contractor, engaged with a gang of men on some rock excavation in New York City. Miner broke into the conversation to ask Ingersoll why he did not invent a rock drill, telling him that he had a gang of men at work striking a steel tool with a hammer to make a hole for blasting, that they could put in only about 10 ft. of hole per day, and that he did not see why a machine could not be built that would do the work. Ingersoll said he could make such a machine and would go at it at once if he had the money. Miner gave him \$50 and his card, saying that though he had never seen Ingersoll before he had an honest face and he would trust him to spend that \$50 in building a rock drill. "When you want any more," said Miner, "come to me and I will give you another fifty."

#### Sergeant's Improvement

Ingersoll's first rock drill was built in a shop at Second avenue and Twenty-second street, New York City, owned by J. F. de Navarro and managed by Sergeant and Cullingworth. One day Henry C. Sergeant saw the patterns for Ingersoll's drill. He noticed that the front head was attached to, and was a part of, the cylinder. He told the workmen that they should be in two pieces and proceeded to saw off the pattern. At this point Ingersoll came in the shop.

"What are you doing?" he asked. "I'm making this thing practical," said Sergeant, as he finished cutting off the pattern before Ingersoll could stop him. The result was the first row between Ingersoll and Sergeant, and it led later to Mr. Navarro purchasing, on Sergeant's advice, all rights and patents held by Ingersoll. The Ingersoll drill was made with the separate front head as used to-day.

Mr. Navarro organized the Ingersoll Rock Drill Company, investing \$10,000 in it. Litigation arose with Burleigh of Massachusetts, who owned the rights of Fowle and others. However, Mr. Navarro's plentiful supply of funds and his liberal nature brought about a settlement of the suits, and all the patents became the property of the Ingersoll Rock Drill Company. The business quickly paid back to Mr. Navarro the \$10,000 he had put into it, and in later years he sold his interests to R. W. Chapin for \$525,000. Sergeant sold out because of friction with the management, went West, engaged in mining, returned to New York about 1885 and organized the Sergeant Drill Company.

#### The Rand Brothers

Early in rock drill developments the Rand brothers, Addison C. and Jasper R., had become interested through their connection with the Laffin & Rand Powder Company. Addison C. Rand formed the Rand & Waring Drill & Compressor Company, later controlled exclusively by Rand and merged with the Rand Drill Company, established in 1871 and incorporated in 1879. J. C. Githens, superintendent of the Rand Drill Company, invented the Little Giant rock drill. He was the originator also of many improvements, notably the double-screw column with column arm, which made practical the application of the rock drill to mining and tunneling.

The Sergeant & Cullingworth Company manufacturing the Ingersoll drill, the Sergeant Drill Company, and the Ingersoll Rock Drill Company were merged into the Ingersoll-Sergeant Drill Company. Later on the Rand Drill Company and the Ingersoll-Sergeant Drill Company were consolidated in the Ingersoll-Rand Company, to-day carrying on the business of all these pioneer concerns. The Rand drill from the beginning had been the most formidable competitor of the Ingersoll and Sergeant types. The conjunction of the Ingersoll-Sergeant and Rand companies, therefore, was a combination of valuable patents in rock drills, compressors and general machinery for mining, tunneling and quarrying. Each shop received the benefit of the experience of all the others and the best features of the Ingersoll, Sergeant and Rand types were taken to make up an improved product. The present company, capitalized at \$10,000,000, sells its product throughout the world. Its machines are the recognized standards in their line, and its constant endeavor is to maintain its standards up to, or even in advance of, the times.

One of the largest plants using lignite for the production of power in the Texas Portland Cement Company, Dallas, Texas. Recently an extensive engineering test has been run upon the equipment of this company by Arthur D. Little, Inc., Boston. The party of engineers assigned to this work was made up of Dwight T. Randall, in charge of the fuel engineering department; John G. Callan, electrical engineer; Charles H. Jumper and Arthur D. Camp, chemical engineers. The rated capacity of this plant is 3000 hp., being one of the largest installations of gas engines and gas producers in this country.

By securing the right to manufacture the Westinghouse automobile air spring, the Westinghouse Machine Company, Pittsburgh, has added another article of manufacture to its productive department which should prove profitable.

# The Foundrymen's Convention at Detroit

## Papers Discussed by the Iron and Brass Sections—A Noteworthy Exhibition— The New President

The Detroit convention of the allied foundrymen's associations of the country, which opened Tuesday, June 7, and ended Friday, June 10, left the same impression on the visitor that he has carried from most of the similar gatherings of the past five years—that it stood at the head of the list. Measured by square feet of floor space occupied by exhibits of foundry equipment and supplies, by the mechanical advance shown in these, particularly in molding machines, the lead of the Detroit meeting was marked. No other meeting had so many good heads at work for so long a time in advance on the details of entertainment. The results in this direction were most satisfactory. As to the sessions for the reading and discussion of papers, the Detroit convention made plainer than ever the overshadowing of all else by the working exhibits. The difficulties encountered in previous years in carrying on discussions free from the noise of machinery and in securing and holding the audience have evidently made it constantly harder to secure papers. The secretary of the association has been most untiring in his efforts, but there has been too much of a disposition to let him carry the whole load. Moreover, foundry questions have now become pretty thoroughly threshed out and to secure good papers requires the co-operation of more foundrymen who are willing to have features of their practice made public. It is well, therefore, that special measures have been set on foot thus early to ensure a creditable list of papers for the Pittsburgh convention of 1911.

### The New President of the American Foundrymen's Association

Following the custom of years of selecting a president from the city in which the next convention is to be held, the Detroit meeting elected Major Joseph T. Speer of Pittsburgh as its president for 1910-1911.

Major Speer is one of the most active supporters of the American Foundrymen's Association and has attended many of its annual conventions. He has been president of the Pittsburgh Foundrymen's Association in the past year, which has been one of the most successful it has had. He was educated in the Western University of Pennsylvania, now the University of Pittsburgh. He received his mechanical training in the employ of Hall & Speer, plow manufacturers, at Pittsburgh, his father being the senior member of the firm. He served a four years' apprenticeship in the pattern shop and later devoted himself to the foundry end of the business. He became manager of Alexander Speer & Sons in 1897. The foundry department of this firm was taken over when the Pittsburgh Valve, Foundry & Construction Company was organized in 1899, and Major Speer is now president of the latter Company. He has traveled widely. In 1876 he went to South America to establish agencies for the sale of plows and for nearly half of each year for a number of years resided in Cuba, having headquarters in Havana. He made a number of trips to Europe in the eighteen-seventies, and had a permanent residence in Munich, Germany, during 1889, 1890 and a part of 1900. He has had an active part in the improvement of the quality of gray iron and steel castings for high pres-

sure service, and was among the first to use semisteel in the manufacture of valves.

### IRON FOUNDRY PRACTICE.

In *The Iron Age* of June 9 a brief account was given of the early sessions of the convention. The

first paper read at the fourth session of the American Foundrymen's Association Thursday morning was by Wilfred Lewis, Philadelphia, on the "Shockless Jarring Machine." It was identical with the paper Mr. Lewis read at the recent Atlantic City meeting of the American Society of Mechanical Engineers as printed in *The Iron Age* of June 9, page 1392. In opening the discussion, James A. Murphy, Hoover, Owens & Rentschler Company, Hamilton, Ohio, said he considered the jarring machine to be one of the greatest labor-saving devices that has yet entered the foundry. He raised the question of air economy in connection with the machine Mr. Lewis had described. Since the cylinder ascends as the anvil descends, and in the first instance the anvil is lifted, there is twice the amount of air used that would be required to lift the table and

return it to a solid foundation. He believed the drop of the table should vary as the depth of the flask. The question in the speaker's mind was how the proper variations could be secured in a jobbing foundry as, for example, between a 1-ton job and a 2-ton job. Where the question of the cost of power was not a great consideration, he thought the shockless jarring machine would be all right, but he believed the principle better adapted to the steam hammer than to the molding machine.



JOSEPH T. SPEER,

President-elect of the American Foundrymen's Association.



E. H. Mumford read the same comment on Mr. Lewis' paper which he had presented when the paper was read at Atlantic City. A synopsis was given in *The Iron Age* of June 9, page 1373. Mr. Lewis again took the floor, and read from manuscript an answer to Mr. Mumford's criticisms. Referring to the criticism of the springs, Mr. Lewis said that wherever there are poor springs it is generally the fault of poor designs, and that the differences between the springs used in the shockless jarring machines are not more than in any other mechanical device employing springs. As to sand and dust, there is less danger in the working of the shockless jarring machines than in other types of jarring machines. Referring to the suggestion of Mr. Murphy that the shockless machine might be employed for forgings, he said that this use had been considered, but that the difficulty was in having the forging in motion. The stroke with the shockless machine would often be ten times as much as if the forging were stationary.

The favorable comment of A. E. Outerbridge, Jr., Wm. Sellers & Co., Inc., Philadelphia, given at the Atlantic City meeting, was read by the secretary.

#### Premium System in the Foundry

W. J. Power, Emerson Company, New York, gave a short paper discussing the premium system of compensation in the foundry. He considered that there was no other craft to which reward for effort can be so appropriately applied as to that of the molder. In every day rate shop he had visited a very leisurely gait was noticeable, while a close check showed from six to six and one-half hours of actual work per day. The payment of premium based on proper standards will bring this amount up to an average of eight hours at a much more intensive gait, and with proper inspection will improve the quality of the work done.

#### Rejected Steel Castings

Harrington Emerson, New York, gave a synopsis of a paper prepared by Samuel D. I. Emerson on "Rejected Castings in Steel Foundries." The author said in part:

In a steel foundry where the writer had an opportunity to study conditions thoroughly, we recorded during a full year's operations 63 different causes of rejection, many of them, of course, accidental and of infrequent occurrence. Twelve principal causes were responsible for more than 90 per cent. of rejections, while 75 per cent. were covered by six causes. To one cause, "cracks," about 50 per cent. of all rejections were attributable. The records were elaborated as to the 12 principal causes, which at once brought to light some interesting facts.

It had been assumed that cracks were largely due to metallurgical difficulties, but our tables showed them to bear little or no relation to heats, but that they occurred principally as to certain castings, the percentage being very much greater on new work than on orders that had been running for several weeks. From this we concluded that they were mechanically avoidable.

As to a certain casting on which five floors had steady work, cracks having averaged for 10 consecutive heats, 17.8 per cent., a careful investigation was made, location of cracks noted on castings, and mechanical means taken to eliminate them. Records as to each day's work were given to the three foremen in charge of the floors. The effect was immediate. In a few days cracks were reduced to an average of less than 2 per cent., the total of all rejections averaging less than 3 per cent. for 30 consecutive heats. The foreman with the best record showed an average of 1.7 per cent. total rejections.

One of our 12 principal causes was "Cope raise" with  $\frac{1}{2}$  of 1 per cent. rejections charged to it. On investigation it was found that cope raises were due to loose cross bars in flasks. New bars were gradually substituted; old ones were repaired. At the end of 60 days cope raises had fallen to an average for the month of less than 1-100 of 1 per cent.

After cracks came "Dirt in mold," averaging over 10 per cent. This was run down and found to be most prevalent as to certain molds which were transferred to pouring floor on flat cars. The handling of these cars was given special attention, and "dirt" fell at once to fourth place on our list, with 0.52 per cent.

The records as tabulated revealed enormous differences in percentage of rejections: 1, as to cause; 2, as to castings; 3, as to foremen; 4, as to molding gang. Rejections under one foreman were more than twice the average of the plant. Under his successor they immediately dropped 50 per cent.

The few examples mentioned indicate in a general way the methods attempted. Records were obtained and the work carried on without special organization and without any scheme of bonus to men or foremen as to rejections. The whole subject received only intermittent attention. At the end of a year's study we reached the following conclusions:

1. In steel foundries, rejections are principally due to accidents or to inefficient methods in core or molding departments.

2. Ninety per cent. of rejections are mechanically avoidable, without reference to metallurgical difficulties.

3. With adequate record, systematic and continual attention, rejections can be reduced to an average of 3 per cent.

4. In order to secure the continual attention required, a separate organization with pay largely dependent on results is most effective.

In the discussion of Mr. Emerson's paper the question was raised as to the average of rejections of steel castings. One member said that his foundry had shown an average of 2 per cent. over a period of three years. Another thought that 6 per cent. would be nearer the general average. J. J. Wilson, Detroit, suggested that much depends on where the line is drawn. Some firms accept what others reject; thus the percentages of rejections might be 3, 5 or 10, according to the strictness of the requirements. J. A. Murphy considered that the steel foundry has the advantage over the iron foundry in that small defects in the casting can be patched up in the case of steel castings.

#### Industrial Education

Paul Kreuzpointer, Altoona, Pa., presented the report of the Committee on Industrial Education, of which he is chairman and the sole member. He emphasized the necessity of industries co-operating with schools, and referred to the wave of interest in industrial training now passing over the country. Industrial companies must make some sacrifices in order to secure the ultimate benefits which are sure to result from this new interest. Albert S. Braughton of the A. L. Swett Iron Works, Medinah, N. Y., commended the work of the Committee on Industrial Education and spoke of the desire of his firm to receive the literature of this committee, to aid it in the work it is doing in this line.

#### Specifications for Foundry Coke

Secretary Moldenke presented a paper on "Specifications for Foundry Coke," with suggestions for standards on this subject. It is given elsewhere in this issue. Comments were made by Prof. J. J. Porter and Warren S. Blauvelt. The latter suggested that where deductions are made they should be a given percentage of the original price rather than so many cents a ton. In making tests there are difficulties, he said, which should be understood by both parties to the contract. One of these is connected with getting a representative sample, due, for example, to the localization of sulphur in certain portions of the shipment. He thought that the shatter test proposed would very much reduce the coal area that can be drawn upon for foundry coke. It would mean that much of the coke now sold to the foundries would have to be marketed as domestic coke, and thus foundry coke would necessarily be higher priced. He suggested the advisability of tests for determining cell space.

Mr. Belden of the United States Geological Survey, who had been in coke testing work for five years, had found that the more study he gave the subject the less he knew. The question of penalties and bonuses presents many difficulties. In cases of disagreement over the chemistry of the coke the difficulty often is to find any of the coke that is in dispute, claims being made after the coke has been used. Foundrymen only have

analysis made when they are in trouble, and it is really a question whether the amount of coke used in the ordinary foundry is large enough to warrant analysis of every carload. Foundries that do analyze their coke regularly no doubt get the best in the market.

T. J. Best said that many entertained the opinion that coke containing as high as 1 per cent. sulphur is not fit for foundry use. He, therefore, thought that 1.10 per cent. as given in the suggested specification was too high and would prefer 0.80 per cent. sulphur. Where the foundry gets coke with the allowable maximum of sulphur and slow melting, it gets into serious trouble with its castings.

H. E. Field, while favorable to specifications for foundry coke, said he realized that foundrymen might get into deep water in taking up this question. The matter of moisture presents particular difficulties. It is impossible to know exactly the condition of the coke at the point of shipment without having a representative there. Present practice is simply to take weights at the point of shipment and abide by them. He thought the question of volatile matter well covered in the suggested specification. On ash, he would have a bottom limit, as some cokes are too low in ash. Cupola construction and operation are also factors. He thought the sulphur maximum too high, since most Connellsville coke producers will sell foundry coke on a 0.90 per cent. guarantee. He considered the questions involved to be largely matters between individual buyers and individual sellers, and therefore what is wanted is a broad specification rather than one going into minute detail.

The paper of David Gaehr, Cleveland, on "Foundry Transportation Methods," was read by title. H. M. Lane presented lantern slide illustrations of various types of electric furnace, and A. W. Moyer, Philadelphia, read a paper on "Overhead Transportation for the Foundry," illustrating with lantern slides the Moyer overhead trolley system.

#### BRASS FOUNDERS' SESSIONS

Four sessions of the American Brass Founders' Association were held. The proceedings of the first of these were referred to in last week's issue. At the second session, Wednesday morning, a paper was presented by Jesse L. Jones, Pittsburgh, on the "Selling of Brass Foundry Refuse." He discussed the practice of disposing of tailings, skimmings, grindings, turnings, &c., to the scrap metal dealers, and on the other hand showed the advantage of disposing of such residue to the smelter. He considered that as a rule the holding of scrap material until a high market is reached is not advisable. The brass founder is not in the scrap metal business, and if he loses at one time by selling at stated intervals he will gain at another, and finds that it evens up in the long run. He believed that every brass foundry will find it to its advantage to get in touch with one or more reliable smelters and become familiar with their methods of doing business on an assay basis. He also advocated having a competent metallurgical chemist examine the by-products of the brass foundry and report on their average copper content and market value.

An interesting address was given by Prof. J. W. Richards, Lehigh University, South Bethlehem, Pa., on the "Electric Power Required to Melt Brass, Bronze, &c."

At the Thursday morning session of the brass founders, Dr. Frank T. F. Stephenson, Detroit, discussed the value of the association to its members. He cited a paper read at the meeting of 1909 by a professor in an Eastern university which contained matter of high practical value. One concern in Detroit, he said, had saved thousands of dollars in the past year by following suggestions contained in this paper. At the present convention a paper prepared by a professor in a Western university, which amounts to a vol-

ume in itself, summarizes information of the highest value to the iron foundry trade.

Dr. J. J. Porter, Cincinnati, in a paper on "Co-operative Courses in Metallurgy," referred to the two classes of men considered as possibilities for the executive side of the foundry—practical molders and engineering graduates. The first are usually defective when confronted by unusual difficulties; the second usually fail because they feel themselves above questioning practical men and learning the practical side of the business. The University of Cincinnati is trying to train up men for responsible foundry positions who combine practical working with technical training. The speaker then described the work in foundry metallurgy done in the University of Cincinnati in co-operation with foundries in that city, similar to that in mechanical lines done in co-operation with machine shops. The professors in charge of the work make the rounds of the shops where the students are working, and on the following week examine them on this work in the university. This course is receiving the hearty co-operation and indorsement of the Cincinnati founders.

#### Mounting Patterns on Molding Machines

The papers considered at the final session of the brass founders were the following: "Modern Foundry Progress," by Charles T. Bragg, Mansfield, Ohio; "Mounting Patterns on Molding Machines," by Hugh McPhee, Tarrytown, N. Y.; "Analysis of Lead in Brass Alloys," by C. P. Karr, New York. Mr. McPhee claimed for his new method the combination of small labor in pattern making and cheapness in using patterns not adaptable to ordinary match plate work. The method consists in making master pattern, and from this enough white metal patterns to fill flask. This completes the work of pattern maker. Molds are then rammed up, patterns drawn, and metal poured into each impression separately flush with the parting line, in both cope and nowel. These patterns are then mounted on iron frames which fit flasks by means of a composition. This method of mounting is also adaptable to bench work.

#### Determination of Lead in Alloys

Mr. Karr's paper discussed the various methods that have been successfully used in the assay of lead in non-ferrous alloys. In the gravimetric method lead is precipitated from its nitrate solutions by sulphuric acid; there is also treatment with a molybdate solution. He spoke of the uncertainty and quantitative inaccuracy of the former and the greater reliability of the latter. Referring to the three standard types of volumetric determination, he awarded the preference to the Low modification of the Alexander or molybdate method, and called attention to the new Rupp method on account of its simplicity, accuracy and rapidity, bespeaking for this cyanide method a careful trial and consideration, especially by the adherents of volumetric methods. He especially commended the colorimetric method for solutions containing an exceedingly small percentage of lead, where great delicacy of treatment is required and accurate results are desired. Going into considerable detail concerning this method, he pointed out the difficulties to be overcome and how the assay should be manipulated to secure quantitative results. He referred briefly to the centrifugic method, one that is little known, but that is now beginning to be appreciated, as particularly adapted to the untrained skill and urgent haste of the foundryman, its rapidity, accuracy and simplicity being its chief recommendations. Referring in general terms to the electrolytic method, he mentioned the one point that is debatable as to its reliability, and gave the conclusions of the highest authorities in reference to this mooted question. The planimetric method, the newest of all, was briefly referred to. This treatment is suitable chiefly for the assay of many alloys, and to make it available in an alloy of many constituents, all but two should be previously eliminated in order to make the comparison reliable and conclusive.

#### Standard Samples of Brass

The secretary read the progress report of the Committee on Standardization of Brass Analysis prepared by Dr. W. F. Hillebrand, chief chemist of the Bureau of Standards, Washington. The report in substance is



as follows: The committee has decided to furnish the Bureau of Standards as its first samples the two following brasses: 1, Red brass, containing copper, tin, lead, zinc, antimony, aluminum, iron and a little manganese; 2, Yellow brass, containing copper, tin, lead, zinc, iron and nickel. Sample No. 1, weighing 98 lb., was furnished by the Lumen Bearing Company, Buffalo, N. Y., in the form of small ingots to avoid segregation as much as possible. Sample No. 2, weighing 145 lb., was furnished by the Bridgeport Brass Company, Bridgeport, Conn. Sample No. 1 awaits the construction of a suitable crusher. After crushing there must be a thorough mixing. Each sheet of the yellow brass, No. 2, will require careful cleaning, and must then be reduced to chips. A machine is now being constructed for thorough mixing without contamination, and without such heating as would cause oxidation. The final determination will be made by the co-operation of a number of chemists. It was stated that it will be several months after the sample is ready for analysis before it can be distributed by the bureau.

#### Magnesium for Deoxidizing Aluminum Alloys

H. M. Lane, Cleveland, gave a brief account of experiments in which magnesium had been employed in deoxidizing aluminum alloys. In view of the difficulty in separating aluminum and aluminum oxide in remelting, it was thought that if metallic magnesium were added to molten aluminum any AlO present would be reduced, MgO being formed, thus leaving clean aluminum. It was found that the strength of aluminum bars was raised by the magnesium addition from 10,000 lb. to as high as 18,000 lb. Zinc chloride was used as a protection of the molten metal against oxidization. Some unexpected increases in strength were found in certain of the bars, and these were attributed to the zinc chloride, but the evidence that this was the cause of the increased strength was not considered conclusive, and further experiments in this direction were considered advisable.

### BUSINESS SESSIONS

#### American Foundrymen's Association

The final session of the American Foundrymen's Association, Friday morning, was devoted to business. A resolution was adopted as introduced by W. H. McFadden, Pittsburgh, providing for the appointment of a committee of five to co-operate with the secretary in securing and editing papers for the convention of 1911. The secretary expressed his gratification at this action, referring to the great difficulty he had had this year in securing papers and subjects for discussion. It is the purpose, in pursuance of this action, to begin at once to arrange for next year's programme and to have all papers printed a sufficient length of time in advance to elicit discussion from those well able to contribute from their experience.

The convention adopted with great alacrity a resolution of appreciation of the work of the Detroit local committee for its lavish entertainment and its untiring efforts in making the convention a red letter event in the history of the association.

J. S. Seaman, Pittsburgh, took the floor to express the association's thanks to the retiring president, Arthur T. Waterfall, Detroit, and on motion Mr. Waterfall was made an honorary member of the association.

A resolution was passed requesting the Executive Committee to select Pittsburgh as the place of the next meeting. In this connection Secretary Moldenke said that urgent invitations had been received from Milwaukee, St. Louis, Dayton, Rochester and Niagara Falls for the convention of 1912. He spoke of the probability of the convention of that year going to Niagara Falls and suggested that the other cities might well be active in securing the convention of the year following.

H. E. Field and William Yagle, Pittsburgh, were named as a committee to audit the books of the association for the past two years.

The question coming up as to the association's constitutional provision on the question of meeting places, a resolution was adopted calling for the publication of the constitution and a revised list of the membership.

#### ELECTION OF OFFICERS.

The report of the Nominating Committee was presented by W. H. McFadden, chairman. His associates on the committee were: L. L. Anthes, Toronto; H. A. Carpenter, Providence, R. I.; Alfred E. Howell, Nashville, Tenn., and J. J. Wilson, Detroit.

President, Joseph T. Spear, Pittsburgh Valve Foundry & Construction Company, Pittsburgh, Pa.; vice-presidents: first district, F. B. Farnsworth, McLagon Foundry Company, New Haven, Conn.; second district, Walter Wood, R. D. Wood & Co., Camden, N. J.; third district, W. A. Bole, Westinghouse Machine Company, East Pittsburgh, Pa.; fourth district, Wm. Gilbert, Buckeye Foundry Company, Cincinnati, Ohio; fifth district, J. J. Wilson, General Motors Company, Detroit, Mich.; sixth district, T. W. Sheriff, Sheriff Mfg. Company, Milwaukee, Wis.; seventh district, Alfred E. Howell, Phillips & Buttorf Mfg. Company, Nashville, Tenn.; eighth district, A. N. W. Clare, Clare Stove Company, Preston, Ont.; secretary-treasurer, Richard Moldenke, Watchung, N. J.

The secretary, on motion, cast the ballot of the convention for all of the above officers.

Major Joseph T. Spear, president-elect, was escorted to the chair and thanked the convention for the honor it had conferred upon him.

After some reference to the preparations now under way for the convention of next year and to the expectation of the Pittsburgh foundrymen to make it a notable gathering, the convention adjourned. A meeting of the Executive Committee was held immediately after adjournment to set on foot plans for the new year.

#### American Brass Founders' Association

The election of officers of the American Brass Founders' Association resulted as follows:

President, N. K. B. Patch, Lumen Bearing Company, Toronto, Ont.; vice-presidents: first district, Thomas Evans, Eynon-Evans Mfg. Company, Philadelphia; second district, W. H. Carpenter, Bristol Brass Company, Bristol, Conn. (for the rolling mill interests), and Richard Augenbraun, Yale & Towne Mfg. Company, Stamford, Conn. (for the foundry interests); third district, W. L. Abate, Nathan Mfg. Company, New York; fourth district, L. W. Olson, Ohio Brass Company, Mansfield, Ohio; fifth district, J. N. Gamble, National Tube Works, Kewanee, Ill.; sixth district, John L. Wolff, L. Wolff Mfg. Company, Chicago; seventh district, J. Cessna Sharp, J. C. Sharp Brass Works, Chattanooga, Tenn.; eighth district, Murray Woodbridge, General Brass Works, Toronto, Ont.; ninth district, Richard R. Mitchell, Robert Mitchell Company, Ltd., Montreal, Canada. Secretary-treasurer, W. M. Corse, Lumen Bearing Company, Buffalo.

#### Foundry and Manufacturers' Supply Association

The annual business meeting of the Foundry and Manufacturers' Supply Association was held at the Hotel Cadillac Friday evening, June 8. F. B. Stevens, Detroit, presided. The report of the secretary, C. E. Hoyt, showed that 26 new members had been added in the past year while 6 had withdrawn, making the present membership 119. The amount of space sold to exhibitors this year was 30,100 sq. ft., as against 17,300 sq. ft. at the Cincinnati convention of 1909. For admissions to this year's exhibit 3892 tickets had been sold. The amount collected from exhibitors was \$14,655 and \$400 was outstanding. Dues had amounted to \$2975. The financial statement of the past year showed

that receipts added to the balance of one year ago amounted to \$22,110 and disbursements to \$6696, leaving a balance of \$15,424.

A resolution was adopted providing for the incorporation of the association, and the expectation is that this can be completed in all its details within 90 days.

The election of officers resulted in the choice of the following. All were chosen unanimously, with the exception of the president. For that office two candidates were presented. E. J. Woodison of the Detroit Foundry Supply Company received 24 votes as against 26 cast for the successful candidate:

President, George R. Raynor, Carborundum Company, Niagara Falls, N. Y.

Vice-presidents: Milford Lewis, Tabor Mfg. Company, Philadelphia; E. D. Frohman, S. Obermayer Company, Cincinnati; T. S. Hammond, Whiting Foundry Equipment Company, Harvey, Ill.; Harry D. Gates, Thomas W. Pangborn Company, New York.

Secretary, C. E. Hoyt, Chicago.

Treasurer, J. S. McCormick, J. S. McCormick Company, Pittsburgh.

Trustees: F. N. Perkins, Arcade Mfg. Company, Freeport, Ill.; H. M. Bougher, J. W. Paxson Company, Philadelphia; E. H. Steedman, Curtis Mfg. Company, St. Louis, Mo.

The Nominating Committee's report was presented by the chairman, E. A. Pridmore, Chicago. The other members of the committee were E. H. Mumford, Martin L. Heyl, W. C. Sly and John C. Pangborn.

The salary of the secretary was increased to \$2000 a year and that of the treasurer to \$200 a year.

#### Associated Foundry Foremen

The annual meeting of the Associated Foundry Foremen was held Thursday evening at the Hotel Pontchartrain. Eugene W. Smith, Crane Company, Chicago, presided. The executive board plan of conducting the affairs of the organization, which had been recommended by President Smith at the Cincinnati convention of 1909, was adopted after some discussion. The thought of the advocates of the plan is that as it will be easily possible to get the members of the executive board together in the intervals of conventions the affairs of the association will receive constant attention and its work be made more effective. Robert B. Thomson, Pitts Company, Buffalo, was elected president for the coming year and C. E. Hoyt, Lewis Institute, Chicago, secretary-treasurer. The treasurer's report showed about \$500 in the treasury. The present membership is about 400.

#### SOCIAL FEATURES

A notable event was the dinner given Monday evening, June 6, at the Hotel Pontchartrain by the Detroit Convention Committee to the officers of the various associations, members of the press and others. Walter S. Russel, Russel Wheel & Foundry Company, was toastmaster. Responses were made as follows: "The Detroit Foundrymen's Welcome," Dr. Frank T. F. Stephenson, Detroit; "The American Foundrymen's Association," Arthur T. Waterfall, Detroit, and Joseph T. Speer, Pittsburgh; "The Foundrymen's Questions," Dr. Richard Moldenke; "The American Brass Founders' Association," W. R. Webster, Bridgeport, Conn.; "The Foundry and Manufacturers' Supply Association," F. N. Perkins, Freeport, Ill.; "The Associated Foundry Foremen," Eugene Smith, Chicago; "The Detroit Foundrymen's Association," J. J. Wilson, Detroit; "The Technical Press," Albert Spies, *Foundry News*, New York; "Our Canadian Cousins," L. I. Anthes, Toronto.

One of the pages of the menu bore a portrait of Dr. Richard Moldenke, secretary of the American Foundrymen's Association, with the inscription, "The Foundrymen's Friend—the Man Who Answers Questions."

A subscription dinner was given at the Hotel Cadillac Thursday evening by the Foundry and Manufacturers' Supply Association. The toastmaster was F. B. Stevens, Detroit. Responses were given by F. N. Perkins, Arcade Mfg. Company, Freeport, Ill., president of the Foundry and Manufacturers' Supply Association; H. M. Leland, Cadillac Motor Car Company, Detroit; Stanley G. Flagg, Jr., Stanley G. Flagg & Co., Philadelphia; A. I. Findlay, *The Iron Age*; E. H. Mumford, Mumford Molding Machine Company, New York; A. O. Backert, the Foundry, Cleveland; C. E. Hoyt, Lewis Institute, Chicago, secretary of the Founders and Manufacturers' Supply Association; J. P. Pero, Missouri Malleable Iron Company, East St. Louis, Ill. Mr. Pero gave an interesting reminiscence of the formation of the first foundry foremen's association in New England in 1887.

A feature of the dinner which had aroused considerable pleasant anticipation was the announcement of the awards of two silver loving cups given by the Foundry for the best operating exhibit and the best still exhibit at the exposition of foundry equipment. A. T. Waterfall spoke for the committee in the absence of its chairman, H. A. Carpenter, Providence, R. I. The other members were Joseph T. Speer, Pittsburgh; Stanley G. Flagg, Jr., Philadelphia, and A. E. Howell, Nashville, Tenn. Mr. Waterfall explained that in making its markings the committee had considered, first, novelty; second, utility, and, third, the exhibit as a whole. The members of the committee first canvassed the exhibits individually and later paid a second visit to each in a body. He announced that the award for operating exhibit was made to the Tabor Mfg. Company, Philadelphia, and for still exhibit to Baird & West, Detroit agents of the Solvay Process Company.

#### THE EXHIBITS

The exhibits in connection with the annual conventions have grown to such magnitude that they have become the center of interest to a majority of the hundreds of business men who attend the meetings of the American Foundrymen's Association. While the technical papers and their discussion in the convention proper are instructive and record each year in imperishable reports the progress of the art, the human yearning to "see the wheels go round" draws even larger attendance to the exhibits, where the materials and the mechanical equipment are presented in concrete, living form. The convention has become an annual foundry show, in which foundry proprietors, managers and foremen expect to find on exhibition the progress of the year in materials, labor saving devices and mechanical equipment.

Detroit offered peculiar advantages for a large and instructive exhibition. When it was decided a year ago to meet there it was expected that a large building, especially designed for events of this character, would be completed. Delays in construction forced the foundrymen to make other arrangements, and they hit upon the idea of utilizing the buildings of the State Fair grounds. The grounds are seven miles from the heart of the city, but good street car service was available, and it was found advantageous in many ways. The general public did not interfere by seeking admission, those actually interested remained all day, and a good hall was provided for meetings. More important than all, however, there was ample room for the exhibits, and it was all utilized. The three main buildings were filled, and a large tent provided a safe place for demonstrating furnaces. The administration building was utilized for the still exhibits, and the two large buildings afforded room for comprehensive exhibits of molding machines and power equipment.

Electric power was available at a nominal expense for connections with the city service, and it was generously utilized. The Chicago Pneumatic Tool Company exhibited an air compressor, driven by a belt and motor, and furnished air free for all the exhibits of pneumatic equipment. The Franklin compressor of the two-stage type, delivering 417 cu. ft. per minute under 80 lb. pressure, enabled all the exhibitors of jar ramming machines to put their equipment through its paces, and there were no resident neighbors to complain of the noise. All the handy little air operated devices for the foundry came from afar to demonstrate their economy and efficiency. There were 12 large exhibits by molding machine manufacturers, demonstrated under actual working conditions, besides several smaller ones which did not require power; and the committee which awarded the cup to the prize exhibit had a hard problem to solve among so many. There were several exhibits of foundry cranes in



operation, as well as other systems of transportation, and a demonstration was also given with a full size foundry magnet. The still exhibitors seemed to have known beforehand the formidable competition they would have in holding the attention of visitors, and their booths were unusually interesting and attractive.

A subject of much comment was the character of the attendance. A large proportion of the delegates were principals or proprietors, and along with them were scores of superintendents and foremen of the largest foundries in the country. In many cases committees came from large establishments, making a careful booth to booth canvass. The orders and contracts taken left no ground for complaint or dissatisfaction. At several exhibits the business actually done amounted to upward of \$10,000; and one visitor gave the jolt ramming people something to think about by asking for estimates on a machine to make 30-ton castings. Space permits only a condensed list of the exhibits, as follows:

- Adams Company, Dubuque, Iowa.—Molding machines, squeezers, snap flasks, pneumatic rappers, sprue cutters, grinding stands, milling machines, automatic gear hobbing machines. Represented by Glenn Muffy, John Nicol, F. O. Farwell, C. F. Reich, William Spensley, L. L. Rich.
- American Blower Company, Detroit, Mich.—Cupola blowers, exhaust fans, Sirocco fan system heating and ventilating apparatus, electric lighting sets, electric forge blowers, small ventilating sets. Represented by R. T. Coe, M. L. Diver, B. E. LaFollette, A. N. Kelley, W. A. Fletcher.
- Anthony Company, New York.—Oil burners for high and low pressure, pit crucible furnaces, tilting furnaces. Represented by N. W. Anthony, A. R. Anthony. Demonstrator, J. M. Nel.L.
- Arcade Mfg. Company, Freeport, Ill.—Arcade automatic molding machines, Arcade squeezers, Norcross jolting machines, Buck roll-out match plate, sand conveyors, pattern plate demonstration. Represented by Edgar H. Morgan, Chas. Morgan, F. N. Perkins, W. C. Norcross, R. M. Burton, G. D. Wolfley, August Christen, Reeve Burton.
- Jonathan Bartley Crucible Company, Trenton, N. J.—Crucibles, retorts, stoppers and a variety of graphite specials. Represented by Lewis H. Lawton, Samuel H. Dougherty.
- Bayer Pattern Plate & Mfg. Company, Cleveland, Ohio.—Composition match plates, match plate composition, combination roll over and squeezer molding machines. Represented by John T. Bayer, G. Knock, Chas. W. Brown.
- Berkshire Mfg. Company, Cleveland, Ohio.—Automatic molding machines, hand squeezers, combination hand squeezing and pattern drawing molding machines, aluminum snap flasks, power riddles and iron flasks. Represented by J. N. Battenfeld, C. F. Battenfeld, R. H. York.
- S. Birkenstein & Sons, Chicago, Ill.—Ingot copper, pig lead, spelter, block tin, Babbitt, scrap metal and drosses. Represented by H. Birkenstein, E. E. Berliner, J. B. Nelman.
- Brown Specialty Machinery Company, Chicago, Ill.—Core machines and equipment. Represented by E. A. Rich, Jr.
- Browning Engineering Company, Cleveland, Ohio.—Locomotive cranes, automatic grab buckets, hoisting and conveying machinery. Represented by H. A. Brown, H. E. Green.
- A. Buch's Sons Company, Elizabethtown, Pa.—Park's portable jar and squeeze molding machines, patented aluminum snap flasks, special method of mounting patterns for molding machine use, special cast iron flask for gravity molding machines, patented steel bar or flask. Represented by R. S. Buch, P. J. Potter.
- Buckeye Products Company, Cincinnati, Ohio.—Parting compounds, brass flux, foundry specialties and supplies. Represented by Charles J. Goehring, Edward H. Leisl.
- Burroughs Adding Machine Company, Detroit, Mich.—Adding and listing machines. Represented by F. H. Dodge, F. S. Wheeler, Ward Gavett.
- Calumet Engineering Works, Harvey, Ill.—Tumblers, ladles, trolley system, cupolas. Represented by H. W. Schulze, J. T. Krieger, C. A. Dugan.
- Carborundum Company, Niagara Falls, N. Y.—Carborundum aloxite wheels, rubbing brick, sharpening stones, emery cloth and paper, fire sand. Represented by G. R. Rayner, C. D. Sargent, F. B. Jacobs, H. A. Eaton, O. C. Dobson.
- Central Foundry Supply Company, Columbus, Ohio.—Foundry equipment and supplies. Represented by Wm. Fenton, J. S. Ball.
- Chicago Pneumatic Tool Company, Chicago, Ill.—Air compressor, pneumatic shipping hammers, sand rammers, sand sifters, drills and hoists, electric drills and grinders. Represented by J. F. Duntley, F. E. Lawson, R. P. James, W. C. Walker, G. W. Parker.
- Cleveland Wire Spring Company, Cleveland, Ohio.—Steel shop and foundry barrels, steel tote boxes, sprue boxes, factory shelving, core trays and racks, coiled wire springs, wire forms. Represented by J. W. Campbell.
- Cutler-Hammer Mfg. Company, Milwaukee, Wis.—Electric controlling devices, foundry magnet in operation. Represented by R. E. Ludwick, R. M. Van Vleet, R. R. Shepherd, C. R. Hammond, C. T. Henderson.
- The Crescent Machine Company, Leetonia, Ohio.—Safety guards for woodworking machinery. Represented by C. G. Wilderson.
- Detroit Foundry Supply Company, Detroit, Mich.—Core ovens, brass furnace, oil burners, glue heaters and cookers, plating dynamos, buffing wheels, platers' chemicals, roll-over molding machine, Gaultier crucibles, nicked work from stove plants, new eccentric adjustable clamp, aluminum snap flask, Grimes roll-over molding machine. Represented by Edward J. Woodison, W. Bruce Howard, Wm. H. Case, Wm. H. Fitzpatrick, Wm. W. Murray, Jas. C. Dissette, Chas. D. Yahne.
- Joseph Dixon Crucible Company, Jersey City, N. J.—Crucibles for brass and steel melting, phosphorizers, stirrers, skimmers, stoppers, nozzles, a general line of graphite refractories, foundry facings, motor brushes and all graphite products. Represented by Dudley A. Johnson, W. E. Allen, F. R. Brandon, A. L. Haasis, Frank Krug, John A. Condit, L. M. Chase, C. D. McIntosh, George Neighbor.
- Wm. Demmler & Bros., Kewanee, Ill.—Hewlett core machine and Kewanee molding machines. Represented by H. L. Demmler, George E. Requa.
- Detroit Testing Laboratory, Detroit, Mich.—Associated with the Toronto Testing Laboratory, Ltd., Toronto, Ontario, and Castings, Cleveland, Ohio. A special feature of this exhibit was a 135-lb. pig of iron and a quantitative showing of the raw materials used in its manufacture and the constituents other than iron in the product. Represented by W. P. Putnam, J. D. Stoddard, Hugh Lamont.
- Detroit Hoist & Machine Company, Detroit, Mich.—Pneumatic hoisting machinery. Represented by J. C. Fleming, F. B. Fleming.
- Stanley Doggett, New York.—Foundry specialties, parting compounds, manganese dioxide, soapstone, graphite facing, facings powdered charcoal, dioxide of manganese flux, ferromanganese, ferrosilicon, iron and steel cement, metal workers' soapstone, crayons and pencils. Represented by W. S. Rupert, Wm. Busser, Stanley Doggett.
- Falls River & Machine Company, Cuyahoga Falls, Ohio.—Wadsworth improved core making machines, core ovens, sand mixing and compounding mills, core cutting off and coning attachments, steel core racks, core prints and the Wadsworth vertical jar-ramming core-forming machine. Represented by Geo. H. Wadsworth, Geo. White.
- Federal Foundry Supply Company, Cleveland, Ohio.—Ceylon plumbago, Bright's dry core binder, ventless facing, molding machines. Represented by W. J. Adams, Ralph Ditty, W. R. Beers.
- The Foundry Specialty Company, Cincinnati, Ohio.—Universal parting, partine, brass flux, fluxing and foundry specialties. Represented by F. W. Weissmann.
- Goldschmidt Thermit Company, New York.—Materials and appliances for the use of the Thermit process in foundries; Titanium Thermit cans for purifying molten iron and steel; nickel Thermit for introduction with cast iron; Thermit for welding and repairing flaws in castings and forging; appliances used for butt-welding wrought iron and steel pipe by the Thermit process; samples of metals and alloys produced by the Thermit process, including chromium, manganese, ferrotitanium, ferroboreon, manganese-copper, manganese-silic and manganese-tin. Represented by Henry S. Mann, J. G. McCarty.
- Guthrie & Howe, Cincinnati, Ohio.—Flaming arc lamps. Represented by G. W. Harris, Chicago.
- Hanna Engineering Works, Chicago, Ill.—Screen shakers, revolving dumping riddles, mold dryers, riveters and Rathbone multiple molding machines. Represented by Wm. I. Laib, James T. Lee.
- Hauck Mfg. Company, New York.—Oil burning appliances, portable heaters, skin drying burners, ladle heaters, kerosene torches, cupola lighters, mold driers, portable or stationary oil burners; forges for annealing, brazing, pipe bending, heating rivets and blacksmithing. Represented by A. F. Link, A. H. Stein, Willis C. Squire, Fred G. Squire.
- Hawley Down Draft Furnace Company, Chicago, Ill.—Schwartz metal melting furnaces, Reyelbec coke crucible furnaces, oil crucible furnaces. Represented by H. J. Stow, D. O'Brien.
- Herman Pneumatic Machine Company, Pittsburgh, Pa.—Herman jarring molding machines, jarring molding machines with roll-over and pattern drawing device, jarring and stripping plate machine, combination jarring and squeezer machine. Represented by Martin L. Heyl, Chas. Herman, Harry T. Frauenheim, John J. Lawlor.
- Hickman, Williams & Co., Cincinnati, Ohio.—Pig iron, coke, steel, ferromanganese, ferrophosphorus, ferrosilicon, silico-alplexel. Represented by H. E. Pierce, E. P. Hettiger, H. Black, John U. Byrd, T. C. Ward, F. S. Fears, J. B. Holloway, S. E. Frazer, Richmond Nicholas, R. B. Miller, T. L. Powell, T. A. Arthur, R. W. Kellow, W. L. Hoffman, B. P. Williams, Day Williams, John Daker, Jr., L. E. Patton, W. L. Hoffman, C. A. Reed, L. H. Miller.
- Hill & Griffith Company, Cincinnati, Ohio.—Foundry facings, core compounds, parting compounds, patent tamping head molders' shovels, bellows, brushes. Represented by John Hill, J. M. Glass, M. Z. Fox.
- Ingersoll-Rand Company, New York.—Compressed air appliances for foundry work, motor driven air compressor, pneumatic sand rammers, pneumatic chipping hammers, pneumatic drills, pneumatic motor hoists, pneumatic stationary motors. Represented by William H. Armstrong, W. A. Armstrong, James Moran, James L. Kelly.
- Interstate Sand Co., Zanesville, Ohio.—Molding sands. Represented by E. M. Ayers, L. K. Brown, U. E. Kanavel, E. B. Wilson.
- T. P. Kelly & Co., New York.—Chaplets, core compound, core ovens, crucibles, cupolas, facings and other foundry equipment and supplies. Represented by Edwin H. Wolverton, John Crowley.
- E. Killing's Molding Machine Works, Davenport, Iowa.—Universal jarring machine, roll-over machine, new automatic power squeezer, combined foot jarring-rockover, long pattern-draw. Represented by E. Killing, C. P. Aabye, Wm. White, A. W. Fox.
- Kroeschell Bros. Company, Chicago, Ill.—Crucible furnaces, ladle heaters, dry stoves. Represented by E. H. Schwariz, W. L. Kroeschell.
- J. S. McCormick Company, Pittsburgh, Pa.—Continuous sand mixer, Deane pneumatic sand sifter, Blake wire straightener, Twentieth Century molding machine and facings. Represented by J. S. McCormick, T. E. Malone, S. R. Costley.
- Walter MacLeod & Co., Cincinnati, Ohio.—Sand blast machines, pressure and suction types, compressed air blacking swabs or sprayers, Babbitt and lead melting furnaces, oil burners for cupola lighting, skin drying molds, brazing, &c.; paint and whitewashing spray machines. Represented by S. Obermayer Company.
- Metal Dross Economy Company, Bristol, Conn.—Represented by A. L. Haasis, W. H. Carpenter.
- Michigan Smelting & Refining Company, Detroit, Mich.—Red and yellow brass ingots, castings from same made by users; solders and babbitts, new metals. Represented by Joseph Silman, general manager; Albert J. Hall, metallurgist; T. R. McNamee, S. R. Ginsburg and H. Levitt, salesmen.
- Benj. Middleditch, Detroit, Mich.—Brass, bronze and aluminum founders' and finishers' machinery, flasks, &c. Represented by Peter De Vries and D. A. Laffrey.
- Millers' Products Company, Chicago, Ill.—Black Diamond core compound and foundry flour. Represented by C. B. Spaulding.
- Monarch Engineering & Mfg. Company, Baltimore, Md.—Furnaces, using oil or gas as fuel for melting and heating, Acme core oven, steel foundry ladle, heating equipment, aluminum

- furnaces, Allis' Eclipse bolt heating furnaces, blowers. Represented by David R. Steele, M. W. Woodburn, James H. Fowler, H. D. Harvey, Jas. J. Allen.
- Mumford Molding Machine Company, New York.—Squeezer with vibrator and match plate, high trunnion squeezer with vibrator and match plate, power ramming plate pattern vibrator machine with starting power pattern draft, plain jolt ramming machine operated in connection with hoist for rolling molds and sand pattern guide for match plates. Represented by E. H. Mumford, F. Hamel, A. J. Goss.
- National Core Oil Company, Buffalo, N. Y.—Core compounds and foundry specialties. Represented by C. H. Cotton, P. L. Crandall, L. C. Allen.
- Northern Engineering Works, Detroit, Mich.—Northern cranes (electric, pneumatic and hand power), Newton cupola, electric and pneumatic hoists, foundry ladles, trucks, core oven equipment, tumbling barrels, foundry elevators, overhead track and trolley systems, surface and industrial railways and turntables. Represented by W. G. Chesebrough, Walter Robinson, W. S. Reid, H. W. Standart, Geo. A. True.
- S. Obermayer Co., Chicago, Ill.—Foundry equipment, supplies and merchandise. Represented by S. T. Johnston, F. H. Dodge, F. J. Brunner, O. J. Peterson, J. E. Evans, C. M. Barker, W. M. Fitzpatrick, E. D. Frohmann, H. F. Frohmann, G. H. Kersting.
- Oliver Machinery Company, Grand Rapids, Mich.—Patternmakers' woodworking machinery and patternmakers' supplies; planers, jointers, band saws, circular saws, sanders' wood trimmers, gap lathes, face lathes, wood lathes, borers, grinders, benches, vises, clamps, fillet, dowels. Represented by Jos. W. Oliver, A. N. Spencer, J. P. Schmidt, W. Y. Mentzer.
- Ohio Sand Company, Conneaut, Ohio.—Molding sand. Represented by F. E. Gordon, Arthur S. Barrows, W. R. Thompson.
- Osborn Mfg. Company, Cleveland, Ohio.—Rock-over jolt molding machines, plain jolt molding machines, hand rock-over drop draft molding machines, Osborn flask stripping molding machines, Economy wire wheel brushes, Cyclone molders' bellows, Slivquick riddles. Represented by H. R. Atwater, F. D. Jacobs, E. T. Doddridge, J. H. Galloway, J. C. Boynton.
- Thomas W. Pangborn Company, New York.—High pressure sand blast systems, and separating machines, sand dryers and air separators. Represented by John C. Pangborn, Harry D. Gates, Jesse J. Bowen, Willis S. Doane, Alfred L. Holmes, Foster J. Hull, Raymond F. Smith.
- Parker Bros. Company, Ltd., Detroit, Mich.—Molding Sand, fire clay, firebrick, coal and coke; Ohio Sand Company, Conneaut, Ohio, molding sand; Ayres Mineral Company, Zanesville, Ohio, molding sand; L. K. Brown, Zanesville, Ohio, molding sand; Interstate Sand Company, Zanesville, Ohio, molding sand.
- J. W. Paxson Company, Philadelphia, Pa.—Foundry equipment, cupolas, sand blasts, ladles, molding machines, foundry facing and molding sand, magnetic separators, tramrail and tripod sifters. Represented by H. M. Bougher, Geo. Moore, A. W. Moyer, I. F. Kremer, W. Scott Thomas, W. T. Nicholson, W. Baetty.
- T. J. Peterson Company, New York.—Core oils, parting rosin, silica wash. Represented by James Kerr, H. S. Peterson, J. Purvis, A. B. Elwes.
- Pickands, Brown & Co., Chicago, Ill.—Solvay coke, exhibiting jointly with Baird & West, Detroit. Represented by J. A. Galligan, B. T. Bacon, G. A. T. Long. This display won the cup for the best still exhibit.
- Henry E. Pridmore, Chicago, Ill.—Small square stand stripping plate machines and patterns, large square heavy double shaft stripping plate machine and patterns, stove plate rock-over machine and patterns, rock-over drop machines fitted with automobile patterns, power ramming rock-over drop machine and patterns, special core molding machine. Represented by Edward A. Pridmore, R. E. Turnbull, D. F. Eagan, W. W. Miller.
- Q. M. S. Company, Plainfield, N. J.—Cylindrical air hoists, hand power traveling cranes, I-beam trolley, I-steel foundry saw. Represented by R. H. Post, F. R. Phillips.
- Robeson Process Company, AuSable Forks, N. Y.—Glutrin core binder. Represented by D. S. Robeson, Henry R. Donald, Martin Pierce.
- Robinson Automatic Machine Company, Detroit, Mich.—Automatic machines for metal polishing. Represented by C. F. Coda, C. Mear.
- Rockwell Furnace Company, New York.—Oil, coal and gas furnaces, oil and gas burning appliances, complete furnace equipment. Represented by W. S. Quigley and A. L. Stevens.
- Rogers, Brown & Co., Cincinnati, Ohio.—Pig iron, coke, fluor spar. The feature of this exhibit was a large wall map set with electric lamps which flashed intermittently, white lights representing the ten sales offices, red lights the blast furnaces and blue lights the coke properties of the company. Represented by Henry B. B. Yergason, F. J. Waldo, Douglas Bissell, F. W. Bauer, R. W. Clark.
- Sand Mixing Machine Company, New York.—Machine for cutting molding sand and for mixing core sands and facing sands. Represented by V. E. Minich, John Bradley, B. F. Doup.
- Wm. Sellers & Co., Inc., Philadelphia, Pa.—Centrifugal sand mixing machines, drill grinding machine. Represented by Edward L. Hollies.
- W. W. Sly Mfg. Company, Cleveland, Ohio.—Exhaust cleaning mills, dust arrester, cinder mill, rosin mill, white iron stars. Represented by W. W. Sly, W. C. Sly, H. R. Morse, D. A. Livensparger.
- J. D. Smith Foundry Supply Company, Cleveland, Ohio.—Natural draft furnaces, aluminum melting furnace, rolling drawer core ovens, sprue cutter, water tumbler, grinder, sand blast installation and three different styles of molding machines. Represented by P. G. Smith, J. S. Smith, M. S. Finley, Jos. Harrison, F. A. Coleman.
- Standard Sand & Machine Company, Cleveland, Ohio.—Machinery for treating sands, power adjustable screen, pulverizing and disintegrating machine, samples of molding sands. Represented by H. E. Boughton, J. A. Boughton, T. J. Morgan.
- Sterling Wheelbarrow Company, Milwaukee, Wis.—Special rolled steel foundry flasks, foundry wheelbarrows, trucks. Represented by I. R. Smith, H. G. Mindrum.
- Frederic B. Stevens, Detroit, Mich.—Foundry facings and supplies, polishers' and platers' compositions, Spanish felt wheels, cotton buffs. Represented by W. J. H. Cluff, J. M. Mayers, Geo. B. Bell, James Hughes, Henry Krigner, Alfred Wagner.
- Tabor Mfg. Company, Philadelphia, Pa.—Standard power squeezing machines, roll-over machines operated by hand and by power, shockless jarring machines, combined jarring and roll-over machines and combined jarring squeezing roll-over machines. Represented by John T. Ramsden, C. W. Coleman, J. H. Coleman, C. H. Ellis.
- United States Graphite Company, Saginaw, Mich.—Plumbago foundry facings. Represented by H. C. Woodruff, Frank B. Godard, J. G. Drought, R. A. Corrigan.
- Whiting Foundry Equipment Company, Harvey, Ill.—Cupolas, tumblers, ladles, elevators, air hoists, sand sifters, brass furnaces, turntables, trucks, core ovens, core oven cars, electric traveling cranes, hand power cranes, jib cranes and other labor saving devices for foundries. Represented by C. A. Hardy, P. A. Dratz, R. H. Bourne, F. A. Rundle, Crad Hughes, T. S. Hammond, W. Mayor, J. B. Clauson.
- Whitehead Bros. Company, New York.—Foundry supplies. Represented by W. Whitehead, J. H. Whitehead.
- J. B. Wise, Watertown, N. Y.—M. R. V. brass melting furnace, tilting type, permanent crucible, using coke as fuel. Represented by R. F. Goynes, Richard Ryan.

## The Pacific Coast Labor Situation

The labor situation in the metal trades on the Pacific Coast is now badly complicated. Three years ago the San Francisco employers and workers entered into an agreement by which the hours of the working day were to be gradually shortened to eight. This agreement culminated June 1 when the San Francisco shops were put on the eight-hour time. The San Francisco employers claim that when the eight-hour agreement was signed by them it was with the understanding that the eight-hour day would be adopted in all shops on the Pacific Coast. Failing in this expectation, they declare that the agreement of 1907 is no longer practicable. The workmen, however, are endeavoring to establish a general eight-hour day and have declared strikes at Seattle and Los Angeles. Hitherto the Seattle shops have been operated on a nine-hour basis and the Los Angeles shops on a 10-hour basis. The wages paid in the several trades in the three cities have been as follows:

Machinists—San Francisco, \$3.50; Seattle, \$3.60; Los Angeles, \$3.50.  
Molders—San Francisco, \$4.00; Seattle, \$3.50; Los Angeles, \$3.75.  
Blacksmiths—San Francisco, \$4.00; Seattle, 47 cents an hour; Los Angeles, \$4 to \$5.  
Pattern Makers—San Francisco, \$5; Seattle, \$3.75; Los Angeles, \$4.50.  
Boiler Makers—San Francisco, \$4.12½; Seattle, \$4; Los Angeles, \$3.30 to \$4.

It will be seen from this statement that men in the Pacific Coast metal trades work more hours and receive less wages in the north and in the south than they do in San Francisco. The San Francisco employers state that the diminution of hours in that city has not only resulted in the loss of business to shops in the north and south of the Pacific Coast but also in the loss of business to shops on the Atlantic coast. This has been demonstrated particularly in shipbuilding. Joseph J. Tynan of the Union Iron Works, in an address before the Commonwealth Club, said:

The death knell of shipbuilding in San Francisco was sounded by the increase of wages following the disaster of 1906 and the eight-hour day agitation that quickly followed. If the eight-hour day has come to stay, the manufacturing end of our metal industries must go.

Against this statement the workmen assert that they are now doing as much work in eight hours as they formerly did in 10, and declare that "the eight-hour day has not yet had a fair trial here under normal conditions." A strong illustration of the loss of business to Eastern shipbuilders is made in the statement that a ship owning company recently offered a differential of \$50,000 for the construction of a steamship on the Pacific Coast, but the local shipbuilders were unable to bid under the Eastern firm which received the contract.

Both employers and workmen in Seattle and Los Angeles confidently claim that they will succeed in the struggle which is now under way. So far the employers seem to have the best of it, as quite a number of shops in both cities continue to run in spite of the strike.



# Large Gas Engines in Steel Works\*

## Their Advantages in Utilizing Gas from Blast Furnaces

BY RICHARD BECHTEL.†

The blast furnace is the largest and best gas producer, indeed produces an ideal gas for high power engines, especially when it is cleaned from dust and humidity, which it can be without difficulty and at very little expense.

The diagram, Fig. 1, shows the amount of gas available from blast furnaces. A blast furnace plant having an output of 250 tons of pig iron per 24 hours requires about 10 tons of coke per hour. Of the quantity of heat put into the furnaces by this coke, 60 to 65 per cent. leaves the furnace again in the gas. About 28

The influence of the gas engine will be felt the more in plants where steel works are attached to blast furnaces, as the larger part of the surplus power gained in the gas engines can then be utilized in the steel works in driving all the machinery, and especially the rolling mills with their large power demands. In Great Britain this amalgamation of blast furnaces with steel works is not always the rule. On the contrary, 75 per cent. of all blast furnace works only produce pig iron. I have no doubt, however, that these conditions will eventually change, as the average British works will be

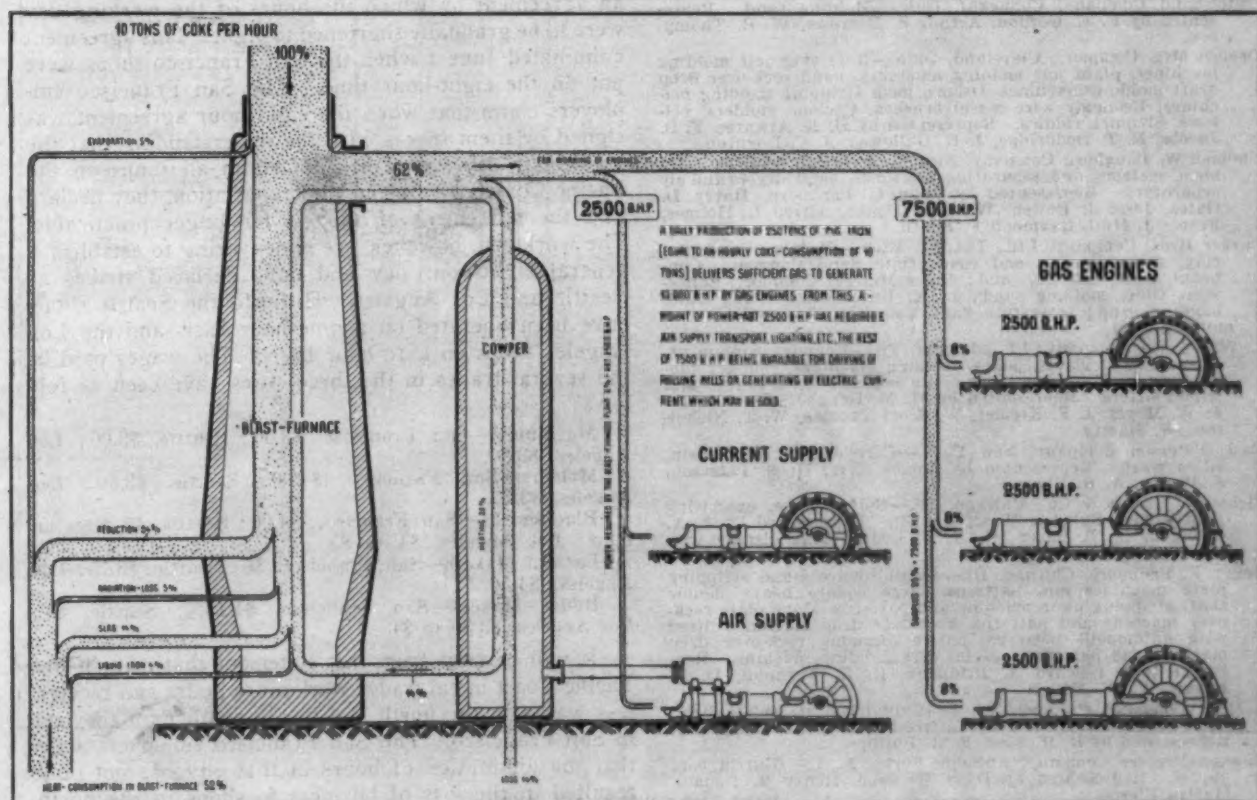


Fig. 1.—Diagram Showing the Economy Possible in the Use of the Heat of a Blast Furnace. Based on a Daily Production of 250 Tons.

per cent. of the heat, or 43 per cent. of the gas leaving the furnace, is used for heating the blast in the stoves, and the rest is available for power purposes. Generally 8 to 10 per cent. of the heat, or 12 to 15 per cent. of the gas, is used for driving the gas blowing engines and for generating electric current for the hoists, lighting and water supply of the furnaces. The power still remaining—about 24 per cent. of the heat, equal to not less than 7500 b.h.p. generated in gas engines—is at our disposal for any other purpose.

Similar conditions prevail in collieries having up-to-date coke oven plants with by-products recovery and surplus gas. The diagram, Fig. 2, shows a coke oven plant of a production of 200 tons of coke in 24 hours. This quantity is obtained by the coal consumption of 10 tons per hour, which gives, after deducting all losses, a quantity of gas equal to 1800 to 2100 b.h.p. in gas engines. If the coke ashes are utilized in special producers a further 900 to 1000 b.h.p. can be obtained by gas engines, giving a total of 3000 b.h.p.

compelled to economize further in the production of iron and steel to successfully meet foreign competition. It follows that the blast furnace owner will endeavor to sell this surplus power, which he will be able to do in the form of electricity to the nearest steel works. As soon, however, as a market for the power is found, every cubic foot of gas which can be transformed into power will become an article of sale.

### Steam and Gas Compared

It is the general practice in coal and iron works without gas engines to generate the steam for several engines in boilers which are arranged in groups, and to conduct the steam by long pipe lines with numerous branches to the engines. As the boilers and pipes must always be under pressure, for the sake of readiness, enormous fuel losses result. These losses chiefly have led to the centralization of the power generation. When centralized in one or a few power stations the engine units chosen can be much larger. A large power engine requires no more attendance and only a little more for store and lubrication than a small engine. By the introduction of large units the working cost can

\* From a paper on the Nurnberg Gas Engine, read before the Birmingham Association of Mechanical Engineers.  
† Of the Lilleshall Company, Ltd., Oakengates, Shropshire, England.





coal and iron works cover the requirements of electricity throughout the whole district. A very interesting scheme has now been tried in the north of Prussia, where a large generating station bought all surplus gases of a newly erected iron works, and feeds them with gas driven generators. The current is sold to the iron works itself and to a large town in the neighborhood. The same idea has been brought into operation on the northeastern coast of England. Here, however, only steam turbines are used, and in spite of the conviction that double the horsepower could have been obtained by installing gas engines. The reasons given were that the cost for upkeep and maintenance of a gas engine plant exceeds those of a steam plant in such a way that the advantages of the gas engine plant are again destroyed, and that the unreliability of gas engines make a steam plant of a large output necessary as a standby.

The costs for upkeep and maintenance of a modern gas engine plant are, according to reports received

on the continent steam engines have been entirely abandoned in favor of gas engines.

Now does a gas engine plant require a steam plant for a standby? No steam is required except possibly in the case of a blast furnace plant, when, should all the furnaces be out of blast, steam or any other power will be required to start one of the furnaces until gas is produced. In a completely steamless blast furnace works in the neighborhood of Hayingen the blowers have been driven by electric motors for starting, whose current has been supplied by works miles off. The George-Marienhütte, at Osnabrück, Fig. 3, is another example of a steamless plant. The whole electric power station, which delivers all power in the form of electric current for the steel works, rolling mills, &c., is alone dependent on gas engines, and gas engines alone are used as standby. In the Haspe Iron & Steel Works, Westphalia, a gas producer plant has been erected to deliver gas if there is lack of gas from the blast furnaces. The large

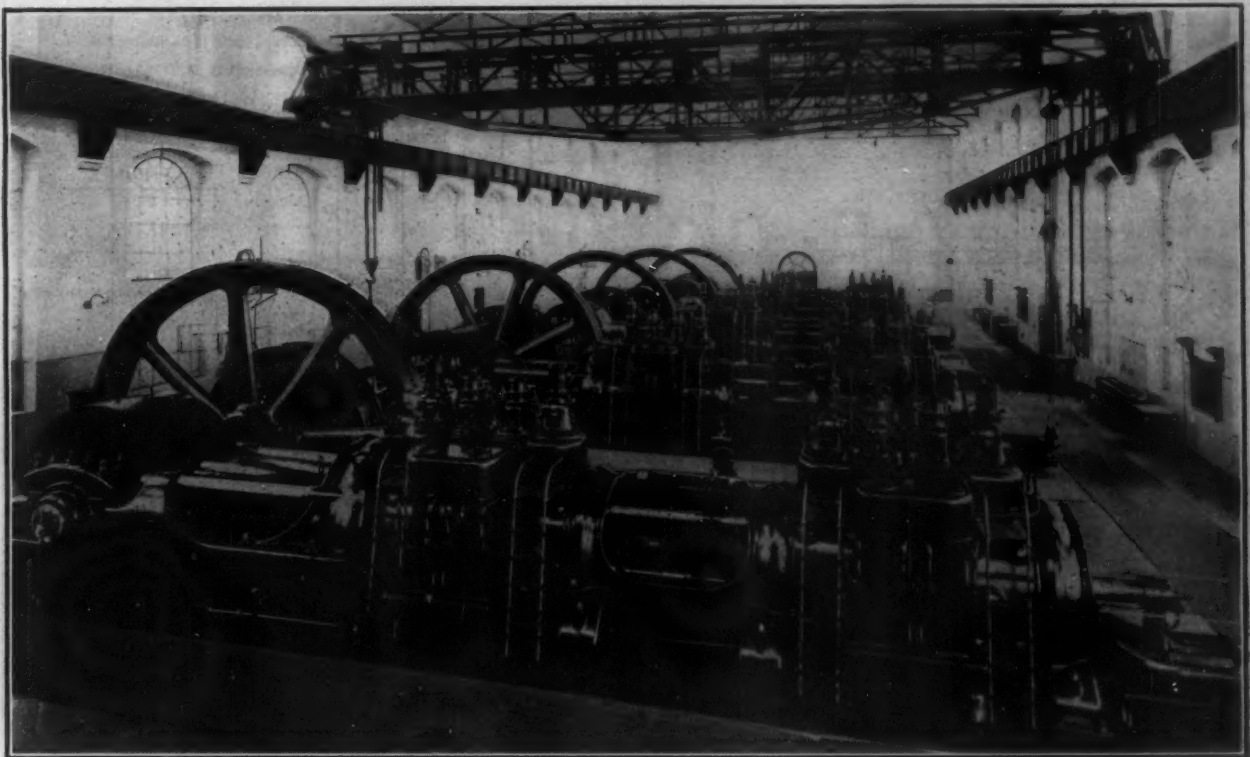


Fig. 3.—Five 1200-Hp. Blast Furnace Gas Engines Driving Electric Generators at the George-Marien-Bergwerks, Osnabrück, Germany.

from many larger plants, about 1 to 2 per cent. of the capital outlay for the gas engine alone. In general, 1 per cent. may be taken as plenty for an up-to-date plant. This figure is practically the same as for a steam turbine plant relatively. Absolutely it is, of course, higher, according to the higher outlay capital of the gas engine, but if the costs for the boilers, superheaters, economizers, and especially of the piping, are also taken into consideration, the upkeep of the steam plant comes to the same, and often even higher than that of a gas plant. The manager of one of the largest iron works states that the costs for upkeep, maintenance and repairs have been considerably smaller for the gas engine plant than for a steam engine plant of the same output.

Respecting the unreliability of gas engines, the best proof to the contrary is that the gas engine is more and more used in coal and iron works, and this in such works where reliability of running is absolutely important. Further, in all cases where they have become familiar with gas engine working, gas engines have always again been installed when an extension or alteration has become necessary. In a number of works

iron works at Rheinhausen, Messrs. Krupp at Schalke, and many other works have only gas engines, without any steam plant as standby.

The newly erected Gary Works in the United States are an interesting example of how the gas from blast furnaces can be utilized in modern iron and steel works. Sixteen furnaces will eventually be working at these works, giving a total of 44,900,000 cu. ft. of gas per day, *i. e.*, 500,000 b.h.p., when used in gas engines. Of the gases 30 per cent. will be utilized for heating the stoves,  $7\frac{1}{2}$  per cent. for steam boilers, 5 per cent. for auxiliaries and lost in the cleaning process,  $12\frac{1}{2}$  per cent. for gas blowing engines, and 45 per cent. for gas driven generators. The electric power station of these works consists of 17 horizontal twin-tandem, double-acting gas engines, 15 of which are arranged for direct coupling to alternating current generators, while the remaining two are fitted for connection to direct current dynamos. The engine units have an output of 4000 b.h.p. each; the total output is, therefore, 68,000 b.h.p.. This is by far the largest gas power station in the world. These engines were built by the Allis-Chalmers Company.

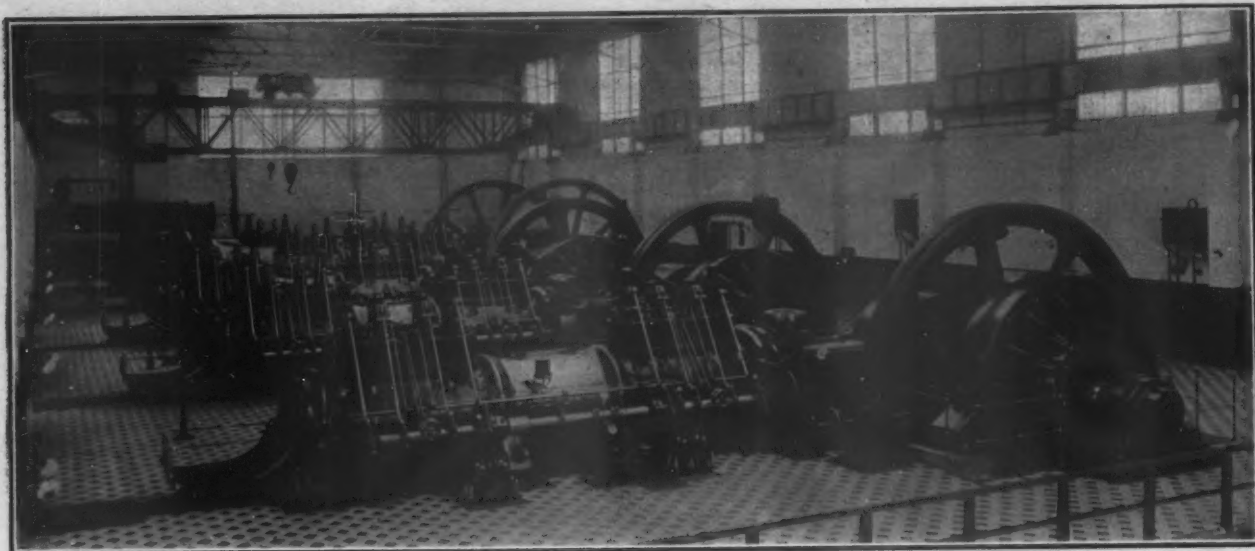


Fig. 4.—Installation at Henschel & Sohn, Heinrichshütte, Hattingen, Germany. Four Gas Electric and Two Gas Blowing Engines Aggregating 8600 Hp.

#### Operating Costs

The cost of attendance can easily be determined by taking for each tandem engine one unskilled laborer as oiler, and for two tandem engines together, or one twin tandem engine, one engine driver (per shift). The cost of wages can be considerably reduced by choosing larger engine units, as the number of attendants depends only on the number of engine units. In coke oven gas plants no further attendance is required; in blast furnace gas plants, one man for the gas cleaning plant is sufficient. By comparing the cost of wages for a gas and steam driven plant, the wages of the men who are necessary for stoking and handling coal and ashes for the additional coal fired boilers will turn the scale in favor of the gas plant, although the turbine itself requires less attendance.

The costs of lubrication of gas engines are higher than those of steam turbines and about equal to those of steam engines.

The cost of repairs, repairing and cleaning wages are, as in the case of the oil consumption, a relatively small item in comparison with the total working and first costs of a large power plant. According to particulars supplied by 11 iron and steel works where Nurnberg gas engines have been running continuously for a number of years, the annual costs of repairs and repairing wages amounted to between 1 and 2 per cent. of the first costs, these including price of the gas engine completely erected, but without building and foundations, also without the electrical portion. The higher

percentage—viz., 2 per cent.—refers exclusively to older plants, and we have found generally that in new gas engine plants the inexperience of the attendants causes at first higher costs of maintenance, but after a little experience of the attendants the cost drops considerably. The upkeep of gas engines will probably be higher than that of steam turbines alone. For an economical comparison, however, the maintenance of the boiler, superheater, economizer, pumps, water softener and piping must be taken into consideration, all of which do not exist in the case of gas.

It therefore appears that the cost of maintenance of power plants driven by blast furnace and coke oven gas are in no case higher than that of steam plants, but, on the contrary, much lower.

A 2000-hp. Nurnberg gas blowing engine during 19 months was actually running 13,639½ hours and standing only 230½ hours. During the first 16 months the interruptions in service represent exclusively the time spent in repairs to the tap hole of the furnace and could only be utilized for the most indispensable work to be done, while during the last three months the repairs to the tap hole of the furnace were of a somewhat longer duration, so that the engine was available 60 hours for repairs. At regular intervals the rinsing out of the jackets took place, and all gathering scale was as far as possible removed. The gas valves as well as the regulating sluices of the gas main were also cleaned at regular intervals. These stops sufficed also for keeping the ignition apparatus in good order. The cross head

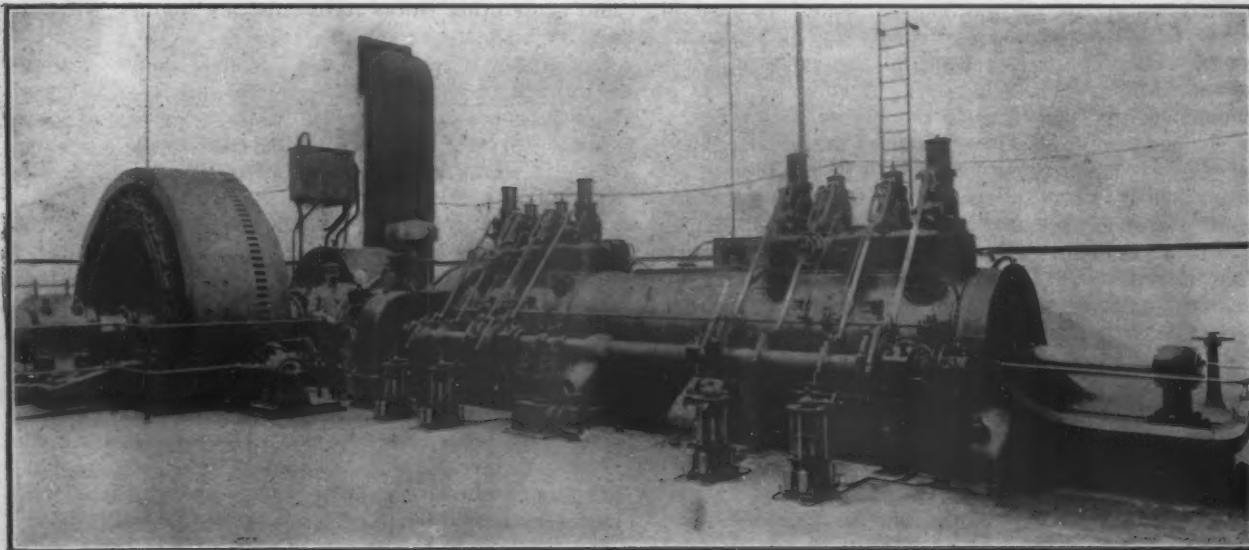


Fig. 5.—A 900-Hp. Tandem Gas Engine in the Brymbo Steel Company, Ltd., Brymbo, England.



and crank shaft bearings were readjusted twice during this time, and each time were found to be in good condition. The lining showed a wear of 1-64 in. on both sides. Each inlet valve was taken out once and cleaned. After the engine had been in operation six months, about four or five air valves of the blowing cylinder were further systematically taken out at each stop; such valves were then cleaned, overhauled in all parts and repaired, and during the next stop were put in place of the same number of valves, which were in their turn taken out, cleaned, &c. By this means it was possible to maintain always the full output of the blowing engine. The stops were too short to allow of large repairs. During these 19 months not one cylinder was opened; neither the gas dust nor the oil residues were removed from the cylinders. There is no reason to-day for interrupting the running of the engine to enable a general cleaning of the interior or repairs to be effected, for the engine can still develop its full output without any abnormal occurrence taking place.

#### Notable Installations

Some of the largest and most interesting Nurnberg gas engine installations are the following:

*Rombacher Huettenerwerke (German Lorraine).—*

densing losses in the piping and cylinders of steam blowing plants. One of these engines develops 2700 and the other 3600 b.h.p. The electric current which is generated from the nine gas driven generators is partly used in the Rombach steel and iron works themselves, partly sent to a colliery in the neighborhood and partly utilized for the lighting of the city of Metz, which is situated many miles off.

*Rheinische Stahlwerke (Westphalia).—*These works contain seven Nurnberg gas engines driven by blast furnace gas, five gas blowing engines of 3200 hp. each and two electric engines of 2000 hp. each. When the five gas blowing engines were installed the output of the blast furnaces could be increased considerably; the steam which became available by the stopping of the old steam blowers was utilized for the rolling mill engines and so the production of rolled material was also increased correspondingly.

*Alsdorf, near Aix-la-Chapelle.—*This is the largest plant of gas engines driven by coke oven gas in the world. It consists of nine Nurnberg gas engines aggregating 14,600 b.h.p. They all drive three-phase alternators and run day and night in parallel. The electric current is used for driving all the machinery at the different pits, and a part of it, after being trans-

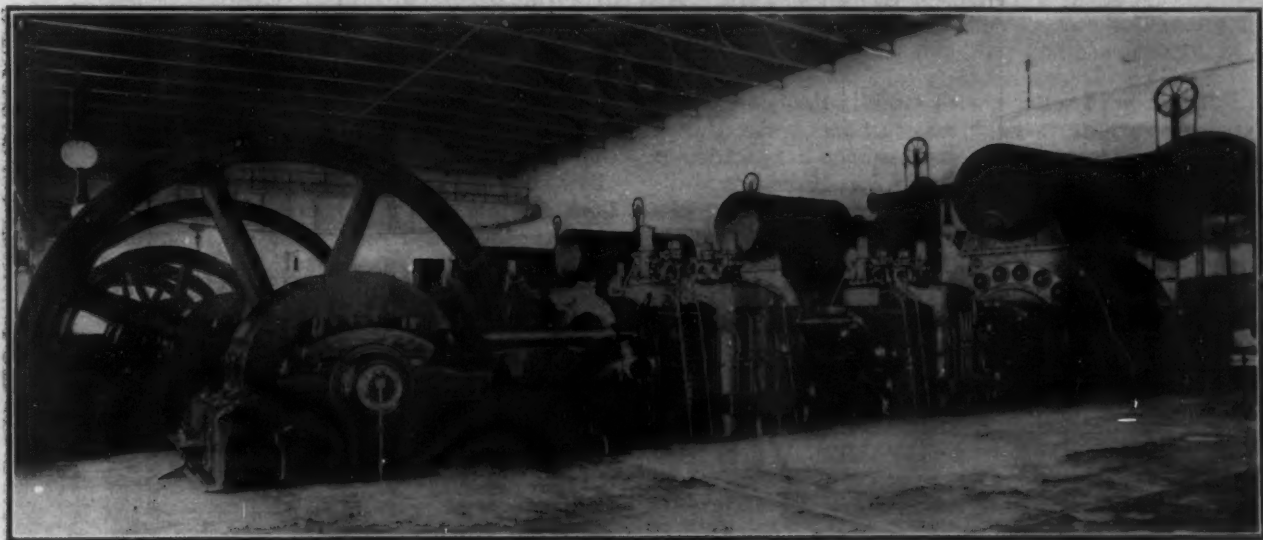


Fig. 6.—Installation at the Barrow Haematite Steel Company, Ltd., Barrow-in-Furness, England. Eight 1200-Hp. Engines.

Here there are 15 gas engines, of altogether 20,900 b.h.p., driven by blast furnace gas, including four gas blowing engines of 950 hp. each, nine electric engines of 1200 hp. each, generating three-phase and continuous current, the gas driven alternator running in parallel without any trouble, and two gas blowing engines for compressing the blast of Bessemer converters. The last two engines are specially interesting, as they were the first of this kind in the world. The blast is compressed to 35 lb. per square inch, automatic Hoerbiger valves being used for the blowing cylinder. To follow the varying requirements of a blast for a steel converter, the forced air quantity and the air pressure is governed by altering the speed of the gas engine between 45 and 90 rev. per min. This is done by regulating the gas for the gas engines by hand. A safety governor prevents the engine from exceeding the highest permissible speed. If the converter does not require blast the gas engine does not stop, but continues running while the forced air quantity is cut off from the converter by a balanced valve which is placed in the blast piping and worked by a relay. The air can thus escape into the atmosphere, and the gas engine runs with no load until the valve is closed and the blowing of the converter starts again. During the intervals in which the blast is cut off from the converter only sufficient gas is required to keep the engine running with no load. This gas consumption is equal to the con-

formed to a tension of 35,000 volts, is conducted to a considerable distance.

*Hasper Eisen & Stahlwerk, Westphalia.—*Nine gas engines of altogether 12,750 b.h.p., driven by blast furnace gas, are installed here. Four are gas blowing engines of 1250 hp. each. One of these has an alternator mounted upon the crank shaft and at its rear end is coupled to a blowing cylinder. It thus serves at the same time as second spare engine for the dynamos and blowing engines. Five engines of 1500 hp. each drive electric generators. These deliver three-phase current and run without difficulty in parallel, despite the sudden and large variations of the load.

This plant is of especial interest inasmuch as the new iron works, built some years ago, were equipped from the beginning with gas engines only. The works consisted originally of steel works and rolling mills only, but the directors realized the advantages resulting from an iron works being directly connected with the steel works in the matter of being able to run the liquid pig iron as it comes from the blast furnaces directly into the steel works, and by utilizing the waste gases of the blast furnaces, so they decided to build blast furnaces and a large gas engine power station. The power so generated is used for all the auxiliaries in the iron works itself, and also for driving the old rolling mills, which were all converted to electrically driven plants.

*Bargoed Colliery of the Powell Duffryn Steam Coal Company.*—This was the first plant in England in which a Nurnberg gas engine was installed, and contains three gas engines of a total of 6000 b.h.p. The first engine develops 1200 hp. and is direct coupled with a three-phase alternator of the Electrical Company, Ltd., of London. The engine has been working since March, 1907, nearly uninterrupted. A second engine of 2400 hp.—the largest gas engine in the United Kingdom—was started during August, 1908, and is also running night and day. Another engine of 2400 hp. was ordered some months ago. The engines run in parallel with each other, and with a steam engine and exhaust steam turbine some miles off.

*Henschel & Sohn, Henrichshütte, Hattingen, Germany.*—This plant contains three blast furnace gas engines of 1500 hp. each and one of 1600 hp., all driving direct current generators, and two gas blowing engines of 1250 hp. each. A view in it is given in Fig. 4.

*Brymbo Steel & Ingot Iron Works.*—A month after the first engine at Bargoed, another Nurnberg gas engine of 900 hp. was started at these works, Fig. 5. It is driven by a mixture of coke oven and blast furnace gas and is coupled to a three-phase alternator of the Electrical Company. The engine has been running uninterruptedly day and night since April, 1907, with the exception of Sundays.

*The Barrow Hematite Steel Company, Ltd., at Barrow,* possesses probably the largest gas engine installation at the present time existing in England, and the Lillleshall Company, Ltd., the licensee for the Nurnberg gas engines in Great Britain and the Colonies, built two of the eight engines already erected. The output of these two engines is 26,000 cu. ft. of free air per minute, at a pressure of 7 to 8 lb. The chief dimensions are: Gas cylinder, 35 in.; blowing cylinder diameter, 85½ in.; stroke, 43¼ in.; number of revolutions, 40 to 95. A view of this installation is given in Fig. 6.

## Thin-Lined Blast Furnaces

### Several Examples of This Type Now in Operation or Under Construction in the United States

A thin-lined water cooled stack is the latest development in blast furnace construction in the United States. A furnace of this type has been in operation at the South Works of the Illinois Steel Company, Chicago, since June 5, 1909, and a second furnace in the same group at that plant is now being rebuilt with a lining of the same general character. The Isabella Furnace of the Carnegie Steel Company, Pittsburgh, of somewhat similar construction, has been in operation since August, 1908. Of this type also is one Central furnace of the American Steel & Wire Company at Cleveland, Ohio, and a stack of the Tennessee Coal, Iron & Railroad Company at Ensley, Ala., is being rebuilt with the thin lining and water jacket. Water cooled shells or jackets have been in use in Germany for 20 years and are considered an indispensable feature of German blast furnace practice, but in the United States this improvement did not come up for serious consideration until a few years ago.

#### The Thin-Lined Furnace Simple in Design

The design of such a furnace is comparatively simple. The thin wall or lining extends from the bosh to the top of the furnace, the bosh and hearth remaining of the construction which is now in general use. In No. 8 Furnace at the South Works, the one which has been in operation for the past year, the shell is built up of cast steel plates with flanges, the plates being fastened to the cylindrical or conical shell by bolts through the flanges. In No. 5 Furnace, however, the one which is now being rebuilt, the shell is of boiler plate riveted together. The Isabella Furnace at Pittsburgh, the Central at Cleveland and the one under construction at Ensley have riveted boiler plate shells. The chief point considered in the shell is to have it strong enough for the purpose.

In the No. 8 Furnace at the South Works the lining is only 9 in. thick. It is built up of refractory brick made from the best refractory clay that can be secured. The bricks are compressed in the process of manufacture and are made with great accuracy, so that there will be no joints on the face of the lining, the bricks having a uniform taper and being laid radially so that one course makes the complete lining. The stack is 95 ft. high and the diameter at the bosh is 22 ft.

#### The Water-Cooling Arrangements

On the outside of the shell are three spraying water pipes which extend around the stack, so placed that

they keep a continuous curtain of water on the exterior shell of the thin lining. The flanges on the sections of this steel shell are narrow, being only wide enough to allow sufficient room for the bolts which bind the sections together, and each section has a deflector on its upper flange which throws the water inward against the shell. A pump supplies sufficient water through the spraying pipes so that the shell is kept covered at all times with the descending curtain of water. In No. 5 Furnace, which is now under construction, the riveted steel shell has a smooth exterior and the water flows unchecked over the surface. In the No. 8 Furnace it may be decided to provide buckets around its circumference similar to the buckets which have been used on the Isabella Furnace at Pittsburgh. On the Isabella Furnace there is a series of what might be called flaring hoops extending upward from the shell, so designed that each hoop forms a bucket extending around the furnace and holding a V-shaped section of water. The water flows from the top of the furnace over the rim of each bucket in succession, falling from one into the next bucket, so that there is a continuous body of water in contact with the shell of the furnace.

Apparently it has not been fully determined in American practice what form of construction is best adapted to the purpose of cooling the upper portion of the stack. In German furnaces many variations are found, one of the recent types of German construction showing a 24-in. wall with hollow cast iron blocks set in it through which the water circulates. As long as the temperature of the brick is kept within certain limits the lining does not become subject to the destructive action of the burden, which the water jacket is designed to prevent.

#### Less Coke Consumed and Shelves Avoided

There are two objects sought in the water cooled lining, both of which tend to the same end. Combustion is retarded in the upper part of the stack, which saves coke. The lining retains its smooth face and proper pitch, so that shelves are not formed, with the undesirable results so well understood in blast furnace practice. The water cooled furnace operates steadily at its full capacity, without the necessity for making allowances for the factor of safety in a furnace in which the lining has become worn.

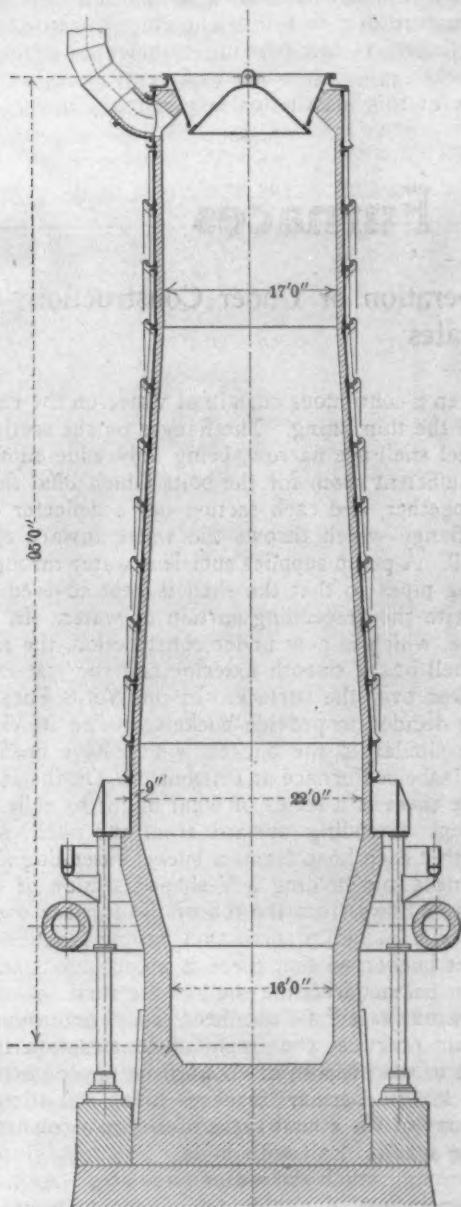
In the ordinary 90-ft. stack as operated in this country the wall or lining is about 5 ft. thick, and the intense heat just above the bosh line causes the lining to



wear away and form a shelf in the wall or a false bosh. The burden clogs on this shoulder or shelf in the worn lining and there is a considerable waste of coke in melting it away. A remarkable saving in fuel results in the thin-lined furnace, by the prevention of shelving and the disintegration of the fuel which occurs in the top of the stack when it becomes too hot.

#### Regular Quality of Product

The group of furnaces at the South Works is recognized among iron men as the most economical furnaces in the United States, and the No. 8 Furnace, with the thin lining, has shown the best performance in this group. Until recently No. 8 did not have enough



Section of Thin Lined Blast Furnace.

"wind" to show any remarkable performance in daily production, but since it has been equipped with new gas engines it has been running steadily in excess of 500 tons per day. The most satisfactory feature of its record, however, is the regular quality of the basic iron which it has made.

When the operation of a furnace is regular the iron shows a lower percentage of sulphur, and this furnace is not only regular, but is not affected to the same degree as other furnaces by differences in the character of the coke. During the past winter freight blockades and other interruptions in transportation which resulted from the severe weather made it difficult to keep furnaces supplied with coke and it was often necessary to use the first coke received, thus causing frequent

changes in the analysis of the fuel used in one stack. The thin-lined furnace showed a very satisfactory performance under these trying conditions. During 10 months the average daily production was 450 tons of iron and the coke consumption was 1934 lb. per ton of iron. With the new blowing engine, in the month of April the coke consumption was reduced to 1722 lb. and the daily production of iron increased to 522 tons.

No. 8 Furnace with the thin lining stands alongside of No. 6 Furnace at the South Works, which is considered one of the best heavy-lined furnaces in the United States. The No. 6 Furnace has a 52-in. lining and was blown in with a new lining shortly before the No. 8 Furnace came in. Occasionally the old style No. 6 Furnace has shown lower consumption of coke for a month than the No. 8, but the average performance of the two for a year shows a considerable advantage in favor of the thin lining. The thick-lined furnace shows a gradual loss in economy owing to the wearing away of its lining and the growing tendency of the burden to form shelves and hot spots.

This loss of efficiency and increase in coke consumption will go on steadily in the case of the thick-lined furnace until it reaches the point where the furnace will be blown out for relining, usually about three years. The thin-lined furnace, however, does not "run down," but showed a better performance in April than in any of the preceding nine months. This record is in harmony with the German theory of blast furnace operation, which might be summed up in few words, to keep the head cool and the feet hot. In the best German furnaces the gas leaves the stack at a temperature of about 212 degrees and is washed before being carried to the hot stoves. Keeping the burden cool in the upper part of the stack saves the coke and promotes combustion at the line of the tuyeres, and the regular movement of the burden without shelving also promotes economy in fuel and the most regular operation.

**The Bridgeport Safety Emery Wheel Company Reorganized.**—The Bridgeport Safety Emery Wheel Company, Bridgeport, Conn., which recently was taken out of the hands of the receiver, has been reorganized, with the following officers: President, E. R. Hyde; vice-president, D. T. Homan; secretary, Elmore E. Grumman; treasurer, Elmer E. Havens. The Board of Directors is composed of these officers and R. E. Parsons. Mr. Hyde was an officer of the old company and has been identified with it in an official capacity for a great many years. Mr. Homan will be the traveling representative of the concern. Mr. Grumman is of the well-known hardware and supply house of Lyon & Grumman of Bridgeport, and Mr. Havens is a member of the Bridgeport steel and iron house of Hunter & Havens. Mr. Parsons is secretary and treasurer of the R. E. Parsons Company, Bridgeport. The company is very busy at the present time, being two months behind on orders.

The United States Motor Company, 505 Fifth avenue, New York, will soon add the Dayton Motor Company to its list of subsidiaries, making the number of plants owned 16, as follows: Maxwell-Briscoe, five, of which two are at Providence, R. I., two at Tarrytown, N. Y., and one at Newcastle, Ind.; Brush Runabout, two at Detroit; Briscoe Mfg. Company, one at Detroit and one at Newark, N. J.; Dayton Motor Company, Stoddard-Dayton and one Courier plant at Dayton, Ohio; Alden Sampson Company, one at Pittsfield, Mass., one at Detroit, and the Gray Motor Company, with one at Detroit. The United States Motor Company expects to have a total production for 1911 of between 50,000 and 60,000 cars, with an approximate value of \$55,000,000. The men now in the employ of the corporation number 12,500, to be increased within the next six or seven months to 17,000.

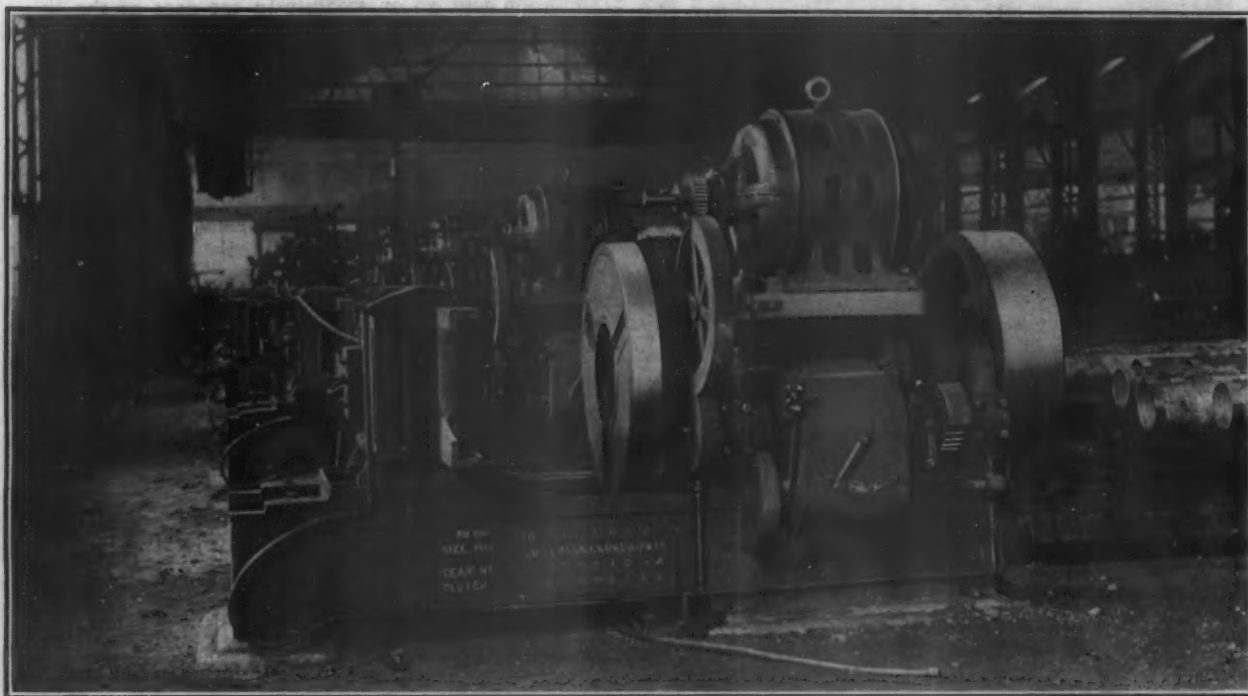
## A Stoever Rapid Pipe Threading Machine

One of the motor-driven pipe threading machines having a capacity for all sizes of pipe from 4 to 12 in. in diameter which were recently installed by the Stoever Foundry & Mfg. Company, Myerstown, Pa., at the mill of the Spang-Chalfant Company, Sharpsburg, Pa., is illustrated herewith. The machine is of especial interest on account of its high speed, the cutting speed being 28 ft. per minute.

A 10-hp. squirrel cage induction mill motor, made by the Westinghouse Electric & Mfg. Company, East Pittsburgh, Pa., and operating at a full load speed of 875 rev. per min. on a 3-phase, 25-cycle, 200-volt circuit drives the machine. The squirrel cage induction motor is particularly suitable for this class of service, since the speed is constant and there are no sliding contacts. The motor shown has the distinction of being the first squirrel cage induction motor designed especially for heavy mill service, and possesses the

Two gripping chucks of very heavy design, made in one piece, without any separate parts or faceplates, are provided, and each chuck has three independent jaws operated by powerful screws. These jaws are made of steel and are equipped with hardened steel plates for holding the pipe. The die head is of the sliding or floating type, which makes provision for any eccentricity in the pipe, and can be pushed to one side and the pipe cut off at a distance of 3-in. from the face of the front gripping chuck. This type of head permits the pipe to be inserted from the front or the rear of the machine without injury to the dies. Rounding blocks are provided for rounding the pipe before it is threaded. The adjusting mechanism, which consists of but two principal parts—a lever for opening and closing the dies and a screw for making the adjustments to gauge—is maintained in a straight line to prevent the chasers digging into the pipe. These are separate pieces of steel, without any pins or links, and any single chaser in a set can be replaced without interfering with the rest.

The oil pump on the machine is of the geared type



A Large Motor-Driven Pipe Threading Machine Built by the Stoever Foundry & Mfg. Company, Myerstown, Pa.

rugged construction and general reliability required for this work. The only wearing parts are the bearings which are very large, rigid and self-oiling, and capable of long service. The motor is started by a Westinghouse auto-starter.

The gear box of the pipe threading machine provides five speed changes and a double train of gears outside of the box gives two speeds for each one in the box, making 10 changes in all, some of which are available without stopping the machine. All the gears run in oil and are carbon steel castings, fitted with bronze bushings, while those that are subjected to the most wear have case hardened teeth. The gearing is located on the outside of the machine, where it is readily accessible. An internal driving gear placed close to the body of the machine is used on the rear of the machine. The machine is started or stopped by a clutch on the operating side of the tool.

The bed is very stiff and strong and is supported at one end by legs and under the headstock by a heavy pedestal base that supports the entire driving mechanism. The headstock is similar to that of a lathe being made in one casting, which contains all the principal bearings, thus securing permanent alignment and great rigidity. The bore of the spindle is of sufficient diameter to pass largest fittings handled by the machine.

and is driven directly from the constant speed shaft. Valves are placed at both the die heads and the cutting-off tool to regulate the supply of oil at these points, and all the surplus flows back into the reservoir in the bed of the machine through a relief valve. All of the bearings are provided with long and deep receptacles for holding lubricating wool and oil.

An unusual quantity of heavy rock work on the Panama Canal resulted in a requisition recently by the United States Government for some special cars of greater capacity and much heavier design than those ordinarily used in construction work. The specifications call for 42-gauge double track cars of 60,000 lb. capacity, the cars not to weigh less than 15,000 lb. The Orenstein-Arthur Koppel Company, Pittsburgh, Pa., was awarded the contract for 12 of these cars and July 15 is stipulated as the date of delivery, this feature of the contract being emphasized by some special clauses. Work on this equipment is being rushed.

The New York Metal Exchange will shortly remove to the Trinity Building, 111 Broadway, as the building at Pearl street and Burling slip, where it has been housed for nearly 30 years, is to be torn down to make room for a modern structure.



# Machinery and Tools in Russia\*

## Its Industries and the Field for American Products

BY CAPT. GODFREY L. CARDEN.

In and around St. Petersburg, Russia, about 225,000 men are employed in the mechanical trades, according to the estimate of Ludwig Nobel of the Nobel Engineering Works at St. Petersburg. Here there is more congestion than in any other part of Russia. Moscow may be regarded as the pivotal point of a second great manufacturing area, but the Moscow district refers to all that country lying within a radius of at least 300 miles. Warsaw is the center of a third great manufacturing area, and close to Warsaw is Lodz, sometimes called the Birmingham of Poland. Americans are apt to speak of Warsaw as distinctly Russian,

in passing the customs, to approximately \$2.58 per 36 lb. This duty is imposed on German tools as well as American, and apparently, so far as transportation is concerned, American tools can reach Russian ports as cheaply as land transported tools from Germany and other continental countries.

The duty imposed on machine tools entering Russia is very favorable to Russian machine tool builders. Broadly speaking, however, the history of machine tool construction in Russia has been one long series of failures. It has not been lack of money altogether, as several have had ample backing from foreign

sources. The trouble has been largely excessive cost of production, due, so far as the writer can learn, to shop methods employed. Close observation in numerous Russian plants leaves no doubt as to the efficiency of the Russian machinist when properly trained, and especially under American instruction. The Russian workman will stick to a tool and become highly proficient in its use. In this respect he differs from the machinists of northern Italy and, in the writer's opinion, the latter are the best of continental Europe. They would probably be unexcelled if they could overcome their general desire to shift

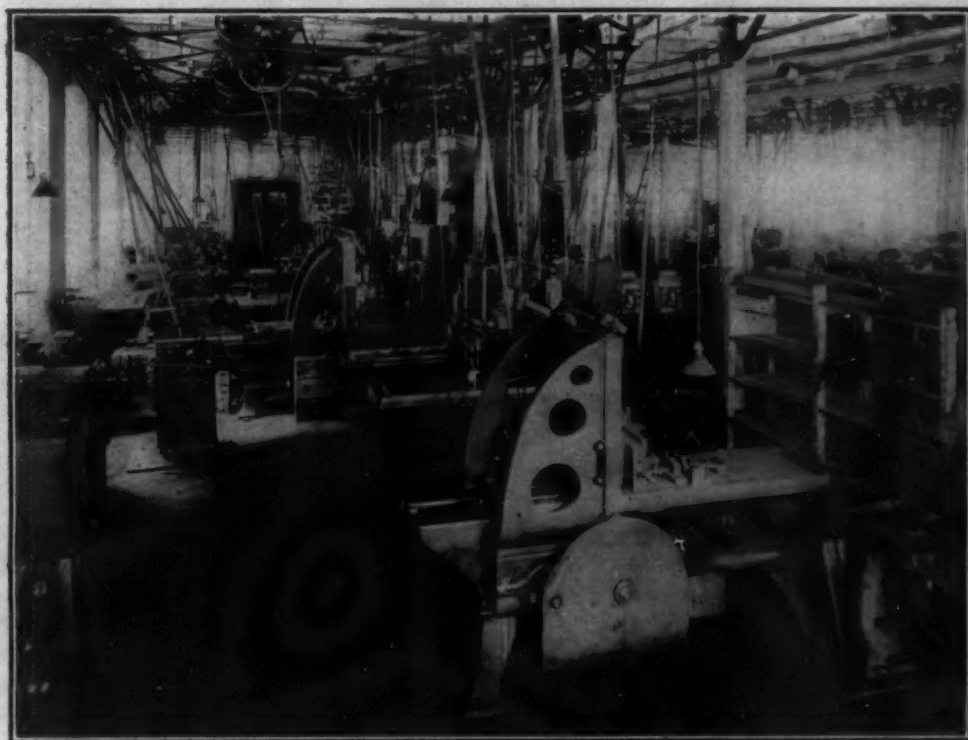


Fig. 1.—Planing and Shaping Department in the Semenoff Machine Works, St. Petersburg, Russia.

but in Warsaw one is reminded frequently that this city is essentially Polish.

Throughout Continental Europe political conditions exert a strong influence. The author has referred previously to the strong national traits of the Bohemians, Moravians, Hungarians and others, and the same is true with reference to the Poles. To the American, accustomed to one flag and one country, this strong predilection or loyalty to a particular state or city is strange, and it must be recognized and understood in considering business relations abroad. Where political conditions are so strongly emphasized the greatest care should be exercised by American firms in assigning agencies, in other words, the agent for any particular territory should be *persona grata*. In treating, therefore, of Russia, the fact must not be overlooked that Poland has a strong individuality of its own.

The opportunity for the sale of machine tools in Russia differs with reference to the respective territories both as to the needs and character of machines required. Russia at present imposes a duty on machine tools of 4.20 rubles (\$2.16) per pood (36 lb.). A number of additional minor costs increase the total cost,

from tool to tool after a three months' tryout. Under Americans such as John Lencke of the Pneumatic Tool Works of St. Petersburg and W. F. Dixon of the Singer Works at Podolsk, Russia, Russian machinists have developed remarkable accuracy and speed. The men of the Singer Works at Podolsk are working to the same gauges as the men in the Singer shops at Elizabethport, N. J. While not up to the speed of the Elizabethport men, the difference is so slight as to excite the admiration of an American. However, it is American instruction that has developed the Russian workmen, and what Lencke and Dixon have accomplished others can do if qualified.

### Gerlach & Pulst

Gerlach & Pulst of Warsaw, under new management, have recently undertaken to manufacture machine tools in series. The head of the firm is General Director Bronislaus Zalenski, a man of wide experience in machine tool construction. The new organization is understood to be well backed, for the firm name has been in existence a number of years. The shops are well supplied with first-class American machine tools, and with this equipment Director Zalenski hopes to reach the Russian market with high grade products. He recognizes that methods have largely accounted for

\* Similar articles on Austria-Hungary by Captain Carden appeared in *The Iron Age* March 31 and May 12, 1910.

failures in Russian shops heretofore. Just now Gerlach & Pulst are turning out lathes, planers, drill presses, milling machines, steam hammers, plate bending machines, grinding machines and bolt cutting machines, and evidently an effort is being made to reproduce a turret lathe of the type built by the Gisholt Machine Company, Madison, Wis.

Attention has been called to Gerlach and Pulst because they represent a comparatively new industry for Russia—the manufacture of machine tools after American methods. Ernst Schiess, Düsseldorf, Germany, is established in Russia, and has done at times excellent business in that territory. Mention could be made of several other machine tool houses now operating in Russia, but the Warsaw firm appears to be the only establishment undertaking to build medium sized tools after a wowed American methods.

The subjects of the Czar total more than 150,000,000, and Russian territory covers more than one-eighth of the entire surface of the globe. In this great nation there are manufacturing possibilities which have only just been touched. The wheat crop of 1909, greater than that of any other country in the world, had to be moved. This required transportation facilities, docks and elevators, and at the rate at which the Russian territory is opening up to development, prodigious efforts will have to be put forth to move increased crops of coming years. The recent great wheat yields of Russia are affording to that country new situations in the economic life. The Singer Works of Podolsk are now working about 2000 men, and the most strenuous efforts cannot afford a sufficient yield to meet Russian requirements. Because of this the Podolsk plant is being enlarged as rapidly as possible.

American machine tools are not reaching the Russian market to anything like the extent that is possible. The competition, as elsewhere in Europe, is largely German, and much of this is in the form of lower

grade tools. Aside from the German competition the English firm of Alfred Herbert, Ltd., must always be reckoned with. The writer has repeatedly expressed it as his opinion that Herbert is the one English firm that measures up to the entire European market. Such American representation as exists in Russia is largely in German hands. Agencies selling American tools are also selling German tools, while again German firms are represented direct in numerous Russian manufacturing sections. Zimmerman of Chemnitz has probably sold as many—if not more—German tools in Poland than any other firm, and maintains an agency in Warsaw and lays especial stress on ability to make quick deliveries.

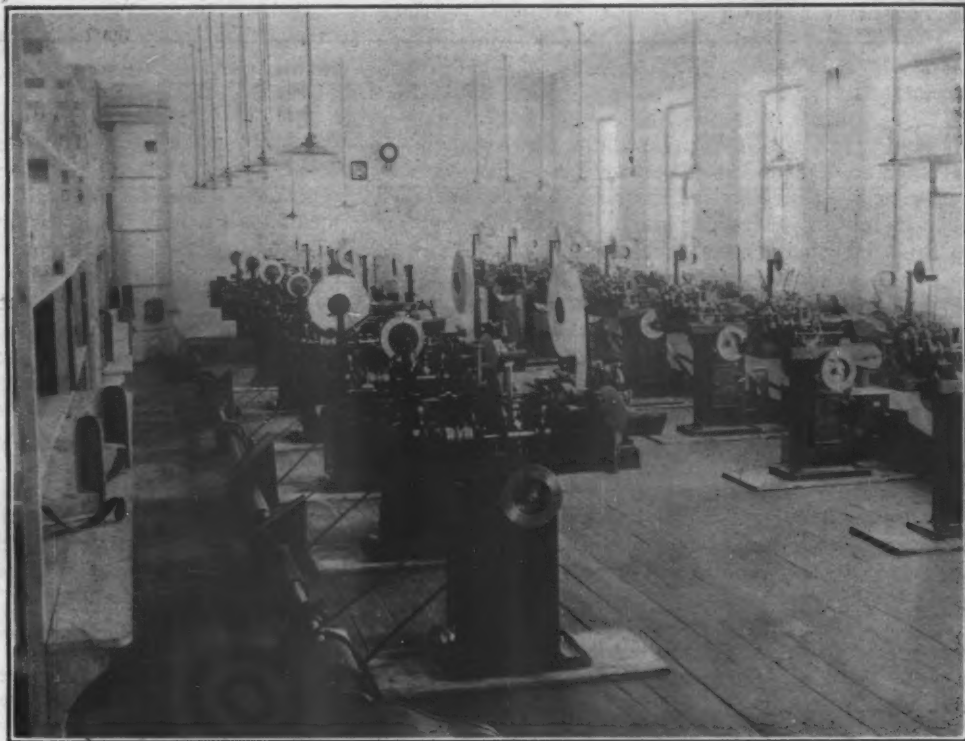


Fig. 2.—Testing Completed Machines at the Semenoff Machine Works.

#### The Semenoff Works

On the other hand, the Semenoff Works of St. Petersburg possess an aggregation of American machine tools on their floors tantamount, almost, to an exposition display. J. A. Semenoff is an able designer, a thorough machinist and a shrewd business man. He has developed his present plant from very small beginnings, and to-day it may be regarded one of the first of its kind, not only in Russia but in Continental Europe. The amazing display of high-grade American tools in the Semenoff shops is due, not so much to the American manufacturers, as to J. A. Semenoff himself. His visit to the St. Louis Exposition convinced him that



Fig. 3.—An Eight-Wheel Freight Locomotive with Stumpf Valve Gear, Built by the Kolomna Locomotive Works, Moscow, Russia.





Fig. 4.—A Towboat on the Volga Built at the Kolomna Works, Equipped with two 400-Hp. Diesel Motors. Towing Power, 15½ Tons.

for high-grade work the best machine tools on the market were to be found in America, and on his own initiative he bought American machine tools and installed them in his St. Petersburg plant. The author counted 19 Brown & Sharpe tools of the medium sizes, 14 Pratt & Whitney tools, six Cincinnati milling machines, seven Warner & Swasey machines, 23 Prentice Brothers lathes, four Gray planers, and machines from many more of our leading machine tool makers. All the twist drills—or practically all—used here come from Morse of New Bedford, Mass., and the taps and dies, with but few exceptions, are purchased from America. The steel of the Crucible Steel Company of the United States is employed in the manufacture of machine parts for all sizes under 1½ in., and this steel is declared to be better than German steel for manufacturing work, such as this plant requires. Views in these works are given in Figs. 1 and 2.

J. A. Semenoff represents to-day in a pre-eminent way the progressive and substantial Russian manufacturer. This man sought out American machine tools, and with American equipment is manufacturing auto-

American machine tools if their attention was called direct to the merits of our machines. The writer was repeatedly asked by Russian manufacturers to recommend tools which might be installed with a view to affording more accurate and economical work. It is the writer's regret that under no circumstances could he make any such recommendations, since his work had to do with reporting the facts, or, in other words, to state the situation as it existed. American machine tools will come into their own in Russia when the business is pushed direct by Americans. Mr. Semenoff states that, notwithstanding the strong selling organizations behind German tools, he has observed that year by year American machines are expelling German ones. The increase in American sales is due more to Russian investigation of American machines than to any effort on the part of American manufacturers to secure their share of the Russian market.

#### The Kolomna Locomotive Works

At the Kolomna Locomotive Works outside of Moscow there is an output at present of one locomotive per day. This figure does not sound large in comparison with American locomotive building, but it means that Russian locomotive plants are developing, and that in time Russia hopes to be able to take care of her own locomotive requirements. Fig. 3 shows a locomotive built here. At this same Kolomna plant they are building steel barges and river steamers, where in single tows of two barges 8000 tons of crude oil is carried. These river steamers, Fig. 4, are operated by Diesel engines, Fig. 5, and all the construction work is undertaken in the Kolomna shops. This plant operates at present about 8000 men, and at the time of the writer's visit

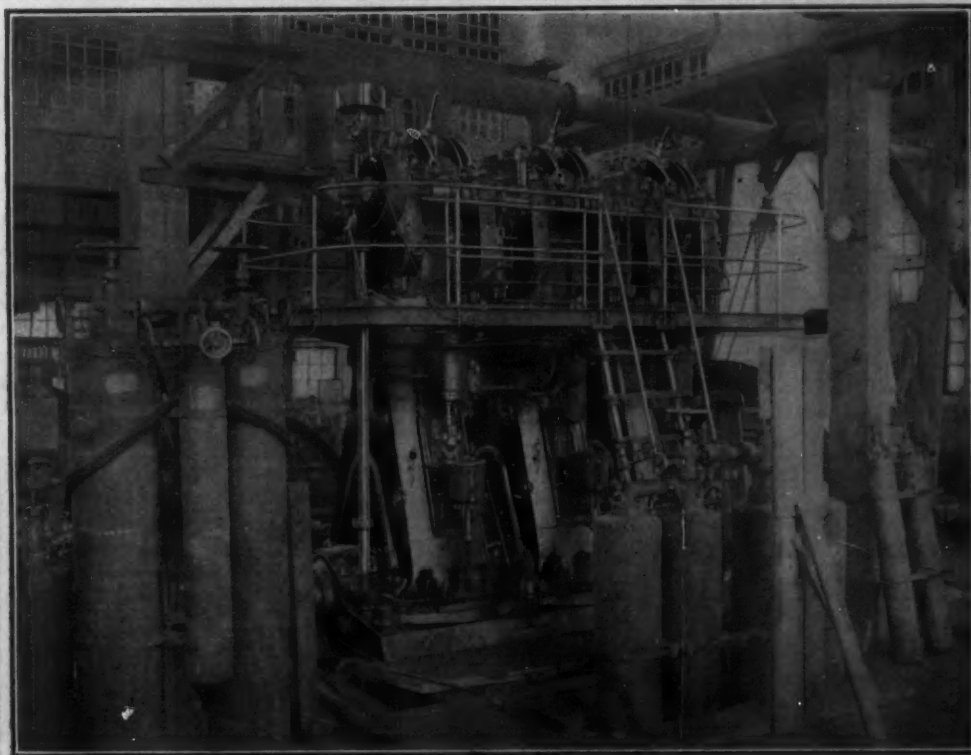


Fig. 5.—A Three-Cylinder 375-Hp. Diesel Motor Built at the Kolomna Works.

matic machinery of high-grade construction; he is even undertaking now to manufacture machine tools, and will shortly build the Prentice type of lathe. There are many manufacturers in Russia who would buy

every opportunity was afforded to inspect the machine tool installation. This establishment is developing rapidly, and aims to produce high grade modern work. The statement was made that no

American had ever called on the present director in behalf of American machine tools. The installation was largely German with some English tools, but there was no question that American representation would have been welcomed and is welcomed. Instance after instance could be cited of Russian shops filled with orders, striving to turn out work of the highest character, and hardly an American machine to be found anywhere on the floors. It was not a case of price, but of downright ignorance regarding American products, and this ignorance will continue, except where directors personally voyage to America and learn for themselves. The ordinary business methods in vogue would seem to indicate that where a market exists that market should be treated by direct representation from home.

#### The Growing Market

The Russian market showed an increase in importation of machine tools in 1908 over 1907. Russia and Austria-Hungary were notable instances of countries that bought more machine tools in 1908 than in previous years. Italy, for example, bought more German tools in 1907 than any country in the world, but in 1908 there was a decided falling off of German machine tool exports to Italy. France, likewise, bought less in the shape of machine tools in 1908 than in 1907, and this statement was very generally true of other countries in Europe. Russia it should be noted increased her purchases in 1908 over the previous year. Doubtless American machine tool makers well remember 1908. During that year many of our best shops were closed, and yet markets existed abroad, which were largely availed of by German builders; Germany exported machine tools to a total weight of 43,629,400 kilos (991.58 tons).

American machine tool houses that may contemplate building in Russia can secure malleable iron castings of excellent grade. The outputs of the Sestroretsk Works is regarded as even better than the ordinary run of United States malleable iron. The wages paid to Russian machinists is expressed in kopecks (100 kopecks equal 1 ruble, or 51.5 cents). At the Pneumatic Tool Works at St. Petersburg lathe men are paid 20 to 22 kopecks per hour; planer men the same; milling machine men and boring mill hands 18 to 20; grinding machine men 15 to 22; foremen 35 to 40; assembling hands 10 to 25; vise men 10 to 12; carpenters 15 to 20, and patternmakers 15 to 30 kopecks.

Director Dixon of the Singer Works at Podolsk expressed the opinion that the establishing of American machine tool works in Russia is well worth consideration, and seemed to think that efforts could be confined advantageously at the outset to the manufacture of a few of the simpler tools, such as are needed in most shops just starting up. Having in mind the territory at present identified largely with manufacturing American machine tools to-day, a market can be found in and around St. Petersburg, Moscow, Warsaw, Odessa, in the Ural country and in the Donetz mining district in the south.

#### The Jacobs Mfg. Company and Its Employees

The Jacobs Mfg. Company, Hartford, Conn., recently posted the following notice in its factory:

This factory will remain closed for vacations during the first week of August. We now have unfilled orders for many chucks which our customers desire shipped immediately. It is very important that we deliver as many chucks as possible before vacation time, and we ask your hearty co-operation to that end. This factory will, therefore, run Saturday afternoons until August 1, unless we get caught up with our orders before that time.

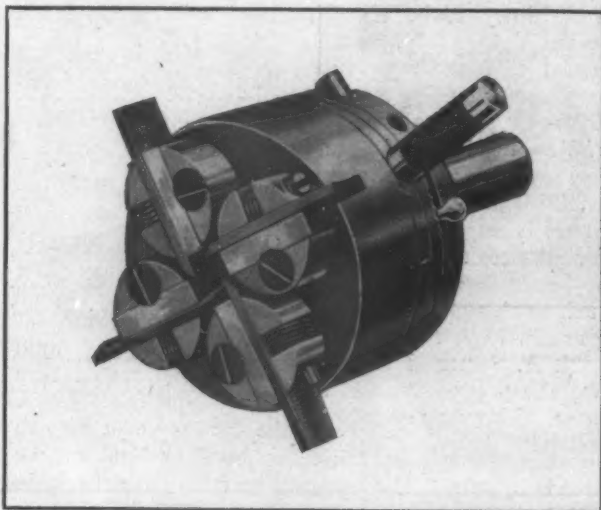
All of our employees who work as full time as possible until August 1 will be given a vacation of one week with full pay, paid in advance, and if we can arrange with Captain Jimmie of Noank, we hope to give you a day's fishing with him, with all expenses paid. We hope that this

plan will please you and that, in view of the fact that you will have the week's vacation with full pay, you will be willing to work Saturday afternoons when necessary.

The company says it is overrun with business and its employees have been steadily at work since their last summer's vacation, but it is determined to give them a vacation of a week this year whether orders are filled or not. Hence the above notice was posted and the men are working on Saturday afternoons with good spirit.

#### The Bickford & Washburn Open Die

In the new open die shown in the accompanying illustration, the maker, Bickford & Washburn, Inc., Greenfield, Mass., has endeavored to solve the problems of threading small commercial taps with this type of tool. The milled thread chaser was adopted for the purpose, on the theory that it possesses advantages over the hobbled cutter in its longer life and the opportunity afforded for securing the full benefit of a shearing cut, which is essential in producing a smooth



A Die for Threading Commercial Taps, Made by Bickford & Washburn, Inc., Greenfield, Mass.

thread on tool steel. The die is designed for use in a hand screw machine, with lead screw attachment and has a body 4 in. in diameter and  $2\frac{3}{4}$  in. long, with a shank 1 in. in diameter. The shank is hollow with a pipe connection so that a strong flow of oil may be introduced from the rear to keep the chips away from the work. The chaser holders are cylinders  $1\frac{1}{2}$  in. in diameter, projecting  $\frac{3}{8}$  in. from the front of the head and operated by a hardened steel plate or ring in the center of the die proper. Thus it is possible to thread with one set of chasers any size of tap within the capacity of the die, the desired cutting size being obtained by the graduated adjusting screw which projects slightly beyond the body of the bend at the right.

Provision is made for taking a roughing and finishing chip cut. The pin, sliding in a slot at the right, operates an eccentric sleeve inside the die, which acts as a stop against the adjusting screw. Turning the pin to the notch for the first cut makes it possible to vary the amount of finishing cut as desired. As only a very small amount is left for the finishing cut, it is possible to maintain an exact size for a large number of pieces. The operating lever is located between the adjusting screw and the pin operating the eccentric sleeve. The chasers are hobbled on the back, and are adjusted by a short worm controlled by a slotted pin. They are secured in place in the holder by a beveled gib and a binding screw for the gib and the chaser. The cylinder is adjusted through the rectangular holes, one of which may be seen at the right of the engraving.



## The Kennedy Newtype Gate Valve

The Newtype water gate valve, the latest product of the Kennedy Valve Mfg. Company, Elmira, N. Y., is especially suitable for use on the water mains connected with a steam plant. As will be noticed from the engravings its construction is very different from any valve heretofore manufactured by this company. Fig. 1 shows the disk seated against the ring, Fig. 2 the small wedging parts and the stem nut, and Fig. 3 the disks which close the ports.

These valves have a double wedging mechanism, parallel seats, and independent stem nut, and a straight-way passage the full diameter of the connecting pipe.

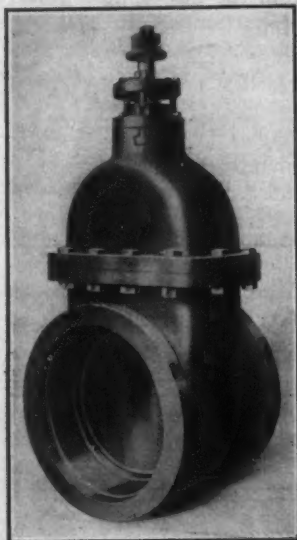


Fig. 1.—The Newtype Valve,  
Made by the Kennedy Valve  
Mfg. Company, Elmira,  
N. Y.

The parallel faces of the seat and disk rings are so close that any foreign matter which may have collected on these rings is scraped off. This permits perfect contact of the seat and disk rings, and thus a tight joint is secured. The construction of these valves is such that they work equally well with either disk toward the pressure.

In closing, the disks, Fig. 3, move to their position opposite the ports and then close squarely against them. The wedges, Fig. 2, which force the disks into position, are of solid bronze, and act on both disks equally. As a consequence, it is stated that the stem is never thrown out of alignment or caused to bend or bind or the threads to strip. The wedging surfaces have the same angle, which makes them interchangeable, and there is a free lateral movement between the disks. After the first movement of the stem in opening the valves the disks release automatically and a continuance of the movement of the stem completes the operation with great ease. The stem nut, Fig. 2, through which the stem revolves, is made of solid bronze. It is loose and separate from the disks and the action of the wedges cannot therefore force it out of a central line. The two sides of this nut are not of the same thickness, and as a result in opening the valve one disk lifts before the other. This draws one wedging face away from the other and it is said makes it impossible for the disk to stick.

These valves can be operated in any position and the construction is declared to embody all of the best fea-

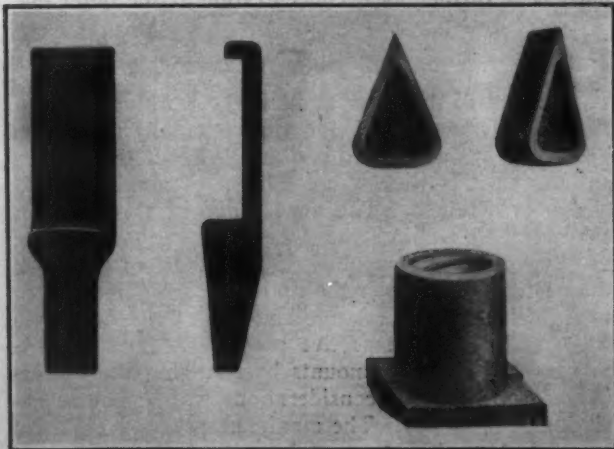


Fig. 2.—Small Wedging Parts and Stem Nut.

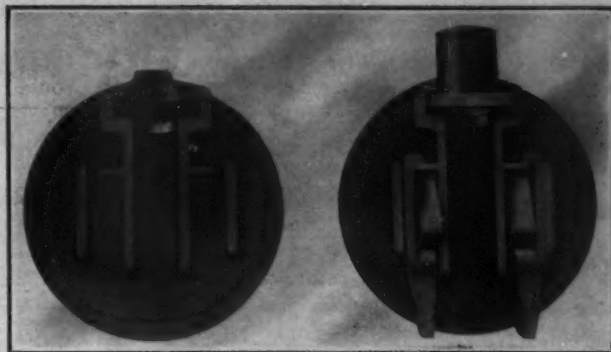


Fig. 3.—The Disks Which Close the Ports.

tures developed up to the present time. A special mixture of cast iron is used for bodies, caps, stuffing boxes and glands, while the disks, hooks and operating nut are of cast iron. The disk rings, stem nut, wedges and seat rings are of bronze and the stems of a special grade of that metal. Wrought iron bolts with standard hexagon nuts are used throughout and all parts of the valves are made interchangeable.

## The Westinghouse Machine Company's Earnings

The following details are embodied in a statement to the stockholders issued by T. S. Grubbs, secretary of the Westinghouse Machine Company, East Pittsburgh, Pa., under date of June 9:

Average annual net income available for interest and dividends, or for capital accounts, for the eight years ended March 31, 1910.....	\$720,543.78
Average annual net income available for interest and dividends, or for capital accounts, for the five years ended March 31, 1910.....	736,719.05
Average annual net income available for interest and dividends, or for capital accounts, for the period from April 1, 1903, to March 31, 1910, exclusive of the years ended March 31, 1908 and 1909.....	841,149.86
The two fiscal years above eliminated cover a period of general business depression and of the receivership and reorganization of the company.	
New income available for interest and dividends, or for capital accounts, for the year ended March 31, 1910.....	875,845.33
Net income available for interest and dividends, or for capital accounts, for the quarter ended March 31, 1910, \$330,286.38, or at the rate per annum of.....	1,321,145.52

It is of interest to note that the orders received for shop product during the fiscal year just closed, ending March 31, 1910, aggregated \$5,125,612.52, an increase of \$2,322,536.88, or 83 per cent., as compared with \$2,801,075.64 during the previous fiscal year; that the billing in shop product for the fiscal year amounted to \$4,065,618.74, an increase of \$1,309,912.94, or 48 per cent., as compared with \$2,755,705.80 during the previous year, and that the net addition to surplus, after deducting depreciation and interest charges (excluding the amount written off for an investment in a subsidiary company manufacturing storage batteries which was liquidated during the year), is \$429,566.61, as compared with a loss of \$228,123.54 during the previous year, a betterment over the previous year of \$657,690.15.

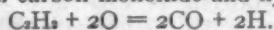
**Alloys for Light Castings.**—C. W. Leavitt & Co., 30 Church street, New York, dealers in metals and alloys, state, in view of the great interest manifested in methods of manufacturing light castings for aeroplanes, automobiles, &c., that alloys are used in Europe for this purpose which consist of 70 to 90 parts aluminum, 18 to 5 parts magnesium and 12 to 2 parts cadmium. Alloys of this composition are recommended for use instead of electroplated metal in the manufacture of various articles and wares and even ornamental work. They are also especially adapted for the manufacture of electric instruments, carriage fittings, bells, gongs, &c.

# The Oxy-Acetylene Welding Process

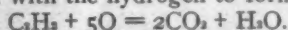
## Chemical Reactions and Typical Applications to Foundry Repairs

BY J. F. SPRINGER.

The maximum temperature within the flame of the oxy-acetylene welding torch probably exceeds 6000 degrees F., and is one of the highest temperatures that can be artificially produced. Acetylene and oxygen come from the tip intermingled at considerable speed. The former is an explosive gas and as it escapes dissociates into its constituents, carbon and hydrogen, with evolution of heat. It is therefore an endothermic substance, *i. e.*, one which absorbs heat upon its formation and liberates it upon dissociation. One whose formation is attended by an evolution of heat and dissolution by the absorption of heat is exothermic, and within the small space occupied by the inner flame of the oxy-acetylene torch this also occurs. The carbon which has been liberated from combination with the hydrogen in the acetylene has an affinity for the oxygen flowing from the tip and forms either the monoxide (CO) or the dioxide (CO<sub>2</sub>). Both are formed by combustion and yield heat, but the amount of oxygen required is different as the formulas show. The acetylene as it issues from the tip and before it has broken up reacts with the oxygen to form carbon monoxide and hydrogen:



Assuming that the inner flame is the locus of the union of the carbon with oxygen to form the monoxide, heat is present at this point both from the dissociation and the combination. If the acetylene forms the dioxide two and one-half volumes of oxygen are required, two for the actual formation of the dioxide and one-half for association with the hydrogen to form water.



This may be regarded as representing the summary of the reactions occurring in the entire flame, but it does not represent the occurrences in the inner flame as a whole. In the torch made by the Davis-Bournonville Company, 96 West street, New York City, the carbon from the acetylene is not permitted to form the dioxide, as the oxygen supply from the tip is limited to an excess of 28 per cent. beyond the volume required for forming the monoxide, this having been found to give a neutral flame, *i. e.*, one which is neither reducing nor oxidizing. This excess oxygen enters the outer flame and with oxygen from the air completes the combustion of the carbon to the dioxide form and of free hydrogen to water. The latter cannot occur in the inner flame where the temperature is above the dissociation point of water. While highly heated steel and other metals have a strong affinity for oxygen, there are two other substances present which are more eager for oxygen, the hydrogen and the carbon monoxide, and their unions, which may not take place in the inner flame because of the excessive temperature, encounter no such obstacle in the molten, but comparatively cool metal, and prevent oxidation of the metal.

### The Flame

The excess oxygen supplied through the tip makes certain the presence of a full volume of oxygen in thorough mixture with one of acetylene. Probably the exact amount indicated by chemistry would be entirely sufficient, if everywhere a particle of oxygen was required it would be present. The inner flame is small compared with the outer flame, being but 0.40 to 0.57 in. long. Within this distance the temperature of ignition must be reached, which for acetylene is about 869 degrees F., the dissociation of the acetylene must take place and the carbon must be burned to monoxide at

least. Evidently the time required by nascent carbon to unite with oxygen, forming monoxide, is short, compared with that required to produce the dioxide, which explains the high temperature of the inner flame. The enveloping flame is much larger, because 1.22 volumes of oxygen must be added from the atmosphere where it is mingled with a larger proportion of nitrogen, and probably CO will not burn to CO<sub>2</sub> until a lower temperature be reached, therefore time and space are necessary.

Assuming that monoxide is formed in the inner flame, and that the equation  $2CO + 2H + 3O = 2CO_2 + H_2O$ , represents the reaction in the envelope, the heat units disengaged in each portion can be calculated. Acetylene consists of carbon and hydrogen in equal parts, whose atomic weights are 12 and 1, respectively. Consequently carbon forms 12-13 and hydrogen 1-13 of the total. The complete combustion of 1 lb. of acetylene yields 21,850 B.t.u.; 1 lb. of carbon to dioxide

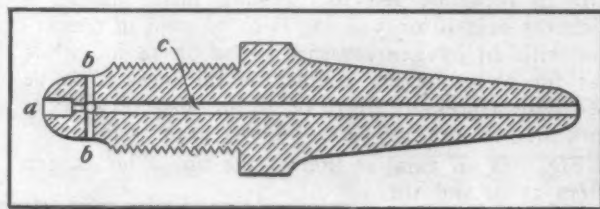


Fig. 1.—Sectional View of the Tip of the Davis-Bournonville Torch.

14,500 B.t.u., and 1 lb. of hydrogen to water 62,000 B.t.u. Consequently, the complete combustion of 12-13 lb. carbon and 1-13 lb. hydrogen will result in the production of  $13,185 + 4769 = 18,154$  B.t.u. The excess of 21,850 over this number is the number of thermal units produced by the dissociation of 1 lb. of acetylene, 3696 B.t.u. The burning of 1 lb. of carbon to monoxide produces 4400 B.t.u., and 1 lb. of acetylene burnt to carbon monoxide will yield, aside from the heat of dissociation, 12-13 of 4400, or 4062 B.t.u. Thus there is obtained for the heats of dissociation and combination in the inner flame,  $3696 + 4062 = 7758$  B.t.u. The time required for the passage of 1 lb. of acetylene from the tip gives the rate of heat disengagement. Comparing the quantities of heat corresponding to the inner and the entire flame it is found that the inner flame gives but 36 per cent. of the total heat, but this is concentrated in a relatively very small space and there must be a further local concentration at the outer end of the central flame.

### The Torch Tip

The end of the inner flame is the working point of the tool. It has been found experimentally that when this flame has a rounded end and is about three times as long as it is wide, the condition of maximum efficiency is obtained. The appearance of this flame is characteristic and indicates whether the proper amount of oxygen is being supplied. The makers of the torch thus determine whether the tip is properly dimensioned to furnish the right relative amounts of the two gases when under their respective pressures. It is possible to vary the relative amounts by changing these pressures, and there are considerations which require variation in pressures. The maximum pressure regarded as advisable with the acetylene is 10 lb. per square inch. The rate of flow of the mixture as it comes from



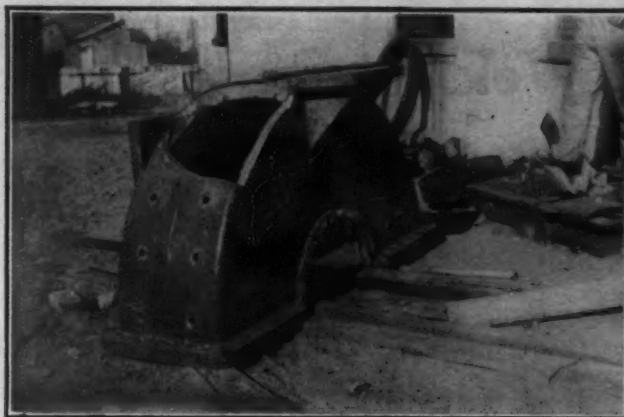


Fig. 2.



Fig. 3.

A Fractured Dredge Pump Casing Before and After Repairing by Oxy-Acetylene Welding.

the tip must be kept within a limit set by the plasticity of the fused metal worked. The cross sections of the various orifices are made the matter of most exact determination for each size of tip. One properly dimensioned tip is no criterion proportionally for another of different size. This is partly because the flow of gases does not seem to vary directly with the variation in the cross section of the orifice, and also because it appears advisable to use different pressures of oxygen with different final exit orifice diameters. The tip recommended for welding metal having a thickness of 1-16 or 3-32 in., is to be used in connection with an oxygen pressure of 12 or 14 lb., while that for plates having double the thickness is to be used with a pressure of 16 or 18 lb. For very heavy work the pressure may be as high as 30 or 35 lb.

Fig. 1 is an axial section of the tip. The oxygen enters at *a*, and the acetylene through four radial inlets, *b*. Just before entering the mixing chamber *c* the oxygen inlet is sharply reduced. As the acetylene comes toward the center it is overtaken by a strong jet of oxygen from the rear, and is driven on into the mixing chamber. This is rather long and gives time for completing the intermixture. It is the dimensioning of these orifices that particularly requires attention in the manufacture of the tips and testing is not only necessary when a new model is produced, but afterward during manufacture because of the change in size of the orifices due to the wear of the tools. In testing for dimensions the torch is lit, and the inner flame brought to standard form by regulating the flow of the two gases into the tip. One of the gases is then cut off, and the torch goes out, while the other is connected to a meter and its rate of flow measured. Similarly, the other gas is measured alone, and finally both gases are measured together, and the result compared with those obtained singly. The data thus obtained should show that 1.28 parts of oxygen are furnished to 1 part of acetylene. If this is the case and

the pressures of the two gases are at their proper points, then the dimensioning is regarded as correct.

It might seem that as 62,000 thermal units set free by the combustion of a pound of hydrogen, this gas would produce a temperature very much hotter than is possible with acetylene, as the latter only yields 21,850 B.t.u. per pound. One volume of acetylene weighs 13 times as much as one volume of hydrogen, and if the comparison is to be made on the cubic feet basis the units are 1-13 lb. hydrogen and one acetylene. The thermal units produced by burning this volume are 1-13 of 62,000, or 4,769, but the comparison is hardly fair to hydrogen, as what is driven out from the tip is a mixture, and the pressure is limited to the resistance of the fused metal of the work. It would seem that with an oxy-hydrogen torch the pressures might be increased to two or three times those per-



Fig. 4.—Joining the Parts of Pressed Steel Window Sash by Oxy-Acetylene Welding.

missible with the oxy-acetylene torch, but even then the thermal units will not equal 21,850. Going still further and increasing the pressure to a point where the number of heat units evolved per unit of time is fully equal or somewhat more than the number developed by the complete combustion of acetylene, would probably not reach the temperature of the outer end of the inner flame of the acetylene torch. The reason for this is that the combustion of hydrogen is a single process, while acetylene burns to carbon monoxide, then to dioxide. It is the remarkable concentration of the heat development of the combustion to monoxide that

enables the temperature of 6000 degrees F. to be reached. Hydrogen may ignite as quickly as acetylene, but hardly anything quite so rapid will take place as the lightning-like dissociation of the acetylene and the equally quick transformation of the free carbon into monoxide, and yet it is to these actions that the generation of 7758 B.t.u. within the minute space occupied by the central flame during the interval of time employed by 1 lb. of acetylene in issuing from the tip is attributed.

#### Procedure in Welding

Such a high temperature as 6000 degrees F. is far above the melting points of all the usual metals, but it is often necessary to supply heat with extreme rapidity to obtain local fusion because of the conductivity of the adjacent metal. Welding with this torch is not properly welding at all.\* It is really localized casting, for the adjoining surfaces are melted or reduced to a plastic condition and fresh metal in a fused state is added. Metal can be added whether a weld is being made or not, and because of these possibilities the oxy-acetylene torch is pretty sure to become a very impor-

mobile transmission had been worn out by the abrasion of the teeth on one side, and it was desirable to repair it quickly, which was done by building up metal all around and then machining to correct form. These examples will suffice to show that new or old castings may have parts welded on or fresh material added, from which the part may be accurately formed. The foundryman will see at once the use that can be made of such a tool as this torch. A casting may have cracks or blow holes, which would render it unfit for use unless they could be corrected, but with the oxy-acetylene torch these may be filled up, and any superfluous metal machined off. A notable case of this kind was that of a 2-ton brass casting, which was found to have several cracks. Instead of scrapping it, the torch was brought into service and the casting reclaimed. Quite as interesting is the experience that was recently gained in connection with the repair of enormous cast iron kettles. These weigh over 18,000 lb. and in use cracks develop which may be 2 ft. long. As the metal is  $2\frac{1}{2}$  in. thick, making repairs is a problem, but it is one to which the torch is quite equal. To accomplish the local casting of metal to deal with a

repair of such size, it is necessary to preheat the work, especially at the locality concerned. In such cases the kettle is overturned and a V-shaped groove chipped out all along the crack. The V is made quite wide and, having chamfered the edges to a bevel of 45 degrees with the bottom of the crack, the first thing is to provide some means of heating immediately underneath. When the metal has become well heated, the torch is applied to the bottom of the groove and metal melted from the sides to fill in the bottom. When this has reached a suitable stage, the operator may add new metal from a stick, melting it off like sealing wax. No new



Fig. 5.—Autogenous Welding of Heavy Plate Work.

tant factor in foundry work. A casting found to be defective because of the accidental omission of some small part, ordinarily, would be useless, but with this torch such a part can often be added. If the part is of considerable size, a piece may be cast or otherwise formed, and then welded on, or the missing part, if small, can be entirely added with the torch. A steel valve when cast was found to lack a boss where a by-pass was to be located, and but for the possibilities of recent methods of welding, this 650-lb. casting would undoubtedly have been scrapped. A forging was made of proper size and form, and then united to the casting, where the omission of the boss occurred. Sometimes it is merely an ear or a lug that has been inadvertently omitted, and the casting may thus be rendered useless. If a new ear or lug can be provided the oxy-acetylene torch supplies the means of quickly adding it on.

It is sometimes advisable to proceed differently. Metal may actually be added and the part built up quickly and without difficulty. A very large gear had one of its teeth, which was about 2 ft. long and 5 in. deep, broken. Here enough metal was put on to build up a blank tooth from which a finished tooth could be machined. A small gear wheel belonging to an auto-

mobile should fall upon the old where the latter is not fused or plastic, and here is where the judgment and skill of the workman come in. Eventually the groove is filled. This procedure could have been applied just as readily to a new, but cracked, casting.

The necessity of preheating may not be clear to some in view of the excessive temperature of the working flame. With small work it may ordinarily be omitted, but when the amount of metal immediately involved is very large, there is a tremendous conduction and subsequent radiation of heat which is prevented by preheating and using a charcoal fire or other ordinary means will effect a much wider distribution of heat. Thus great variations in temperature between nearby parts are avoided and the effects of expansion and contraction minimized, which is exceedingly important. As it becomes more and more understood and the effective precautions are discovered, the field of application of the oxy-acetylene torch may be expected to widen. Already great strides have been made and work is now possible which not so long ago would have been out of the question. When the work is heavy, preheating seems to be the means of securing success.

Some question may arise as to whether welds made by local casting are sufficiently strong. If the bulk of the metal is cast there would seem to be no reason to question a local part also cast, even if the local casting

\* See "Oxy-Acetylene Welding and Cutting," in *The Iron Age*, January 7, 1909.



has been effected with a torch. But if the material is forged or rolled steel where an improvement has been brought about by working the metal the subject needs more than a superficial glance. Cast steel, not reheated, will be weaker than steel which has been worked, because its crystalline structure is larger. Working breaks up these crystals and smaller ones form if the working is not continued below a certain temperature. It is evident that a steel weld formed by this local casting process will have large grains if allowed to cool undisturbed. Hammering the new formation as it cools is one remedy. But another, which requires no hammering, is reheating to a temperature determined largely by the carbon content of the steel, that the large grains may be broken up into smaller ones, and it would seem advisable to reheat work whether it has been hammered or not. In this way parts which have not been reached by the hammer will be treated. Thus, suppose the cast steel frame of a machine whose carbon content is 0.50 per cent. has been broken and the welding of the two broken ends has heated up all the added metal to the melting point, the metal adjacent has been heated to a high temperature although not quite to the melting point unless on the sides of the V-groove and for a considerable distance on each side there has been a high heat from the torch alone or from torch and preheating. If the whole were allowed to cool undisturbed there would be a variety of sizes of grain, and consequently a variety of qualities of steel, and in the weld itself the metal would probably be poorest. To remedy this the weld and adjacent parts may be hammered continuously until the temperature has fallen to about 1400 degrees F., or perhaps a little lower, but some parts may not have felt the influence of the hammer, and so it would be well to reheat the piece to that or a little higher temperature. The temperature given for cessation of work and for reheating are only for the steel specified, or one whose carbon content is practically the same. With low carbon steels the reheating procedure will probably not give as good results as a thorough working.

#### Typical Repairs

A cast iron air cylinder weighing less than a ton and which required considerable machining, including the drilling of a large number of holes was found to have a blow hole opening into the air chamber, but by the oxy-acetylene torch this new casting was repaired at a trifling expense. Fig. 2 is an example of a break in a large casting where the metal was about  $2\frac{1}{2}$  in. thick. The entire line of fracture was 11 ft. long, and included 4 ft. more than the edge of the opening shown as the portion broken out was in more than one piece, and was a compound fracture. Fig. 3 shows the same casting, the centrifugal pump casing of a dredge after repairing.

The torch and process promises to become an important factor in the fabrication of sheet metal. Already it has received application to the construction of steel railway cars. The Pennsylvania Railroad is said to have stipulated that the ceilings of passenger coaches shall not be riveted. In Fig. 4 an application of the torch to the fabrication of steel window sash is shown. The oxygen tank is seen on the floor of the workroom, and the acetylene is supplied by a pipe which brings it from a more remote reservoir. Fig. 5 illustrates the welding of very heavy plate. The usual practice had been to construct these galvanizing tanks with riveted seams. While the tank was good when it was just finished, it could not be relied on to stand the expansion and contraction incident to heating when in service, and the consequent movement of the plates had disastrous effects upon the riveting. It has been found advisable, therefore, to unite the metal in a more intimate manner. The portability of the tool is apparent. The oxygen reservoir is to the left and behind the workman. The acetylene is supplied by the

tube passing back of the man's head, where the acetylene pressure regulator is located.

For large works using numerous oxy-acetylene torches, it is good practice to furnish the acetylene by a general supply pipe in which the pressure can be standardized at 10 lb. per square inch. Attaching tubes at convenient points and fitting them with individual pressure regulators enables the workmen to handle operations advantageously.

#### The New Underwood Pipe Bending Machine

The pipe bender which is shown in the accompanying illustration has been placed on the market by H. B. Underwood & Co., 1025 Hamilton street, Philadelphia, Pa., and besides being efficient for the bending of pipes may also be employed as a bulldozer and power bender. The length of stroke is 15 in., and the control very flexible. The rectangular work table is of ample dimensions and numerous holes are provided for conveniently locating dies and pins. No obstruction that will interfere with the work in any way is presented by the top of the table, as it is perfectly flat. The large number of dies which are ordinarily required for bending a great variety of pieces is avoided, as sim-



A New Pipe Bender Built by H. B. Underwood & Co., Philadelphia, Pa.

ply changing the position of the resistance studs permits varying the shapes at will. The ram, located beneath the table, slides in a strongly constructed guide and is provided with a stud projecting above the table on which a roll of suitable size may be placed. Steam or compressed air may be used to operate the machine and for the former a metallic packing is used on the piston rod and for the latter a leather packing. The use of compressed air has many advantages over the use of steam and the maker recommends it as a motive power when available. The diameter of the cylinder is 20 in. and the supply of working fluid admitted to the piston is the only limit placed on the power of the machine.

A special feature that is very advantageous and worthy of particular attention is that the piston has air on both sides of it at all times. Because of a special construction of the operating valve only the amount of working fluid required for actual bending is wasted, as it is transferred from one side of the piston to the other and the piston is forced forward because that side offers a larger area than the other, which is smaller because of the space occupied by the piston rod. Thus the piston can be moved only a fraction of an inch when necessary, or it may be held perfectly stationary for measuring the work. Such a precise control is desirable in all sorts of bending work and is particularly useful in straightening bent pieces.

The Firth-Sterling Steel Company of Pittsburgh has recently made some additions to one of its shops at Geisboro Point, near Washington, D. C., which will give the plant considerably increased capacity.

## The Roto Boiler Tube Cleaner Head

A new boiler tube cleaner for which many advantages are claimed has been developed in connection with the new Roto valveless rotary motor for boiler tube cleaning made by the Roto Company, P. O. Box 1043, Hartford, Conn. One of the points of superiority claimed for this new head over those hitherto brought out is that in the latter the cutter arms swing on cross pivots, which changes the angle with the tube and often results, it is claimed, in only the edge of the cutter coming in contact with the boiler tube, thus cutting spiral grooves in the metal of the tube without removing all of the scale. This is said to be entirely overcome by the new head, and at the same time it possesses as other advantages greater speed and durability, and the turning out of more thorough work.

This head is shown in the accompanying illustrations and the construction can be clearly seen from them. Fig. 1 shows the head ready to attach to the motor shaft, and at the left in Fig. 2 is shown the spider with the hinge bolts in place, and at the right is one of the swing frames loaded with cutters and ready to replace a worn out set. The cutters are carried on swing frames pivoted longitudinally to a steel spider and furnished with stops to limit the swing. Where the scale on the tubes is not heavy the advance cone cutters are replaced by straight ones.

In operation the cutters are forced against the inner surface of the boiler tube by centrifugal force due to the high rotative speed of the motor to which the head is attached. A retaining ring, which is not shown, slides over the hub and securely locks the hinge bolts against coming out or turning, and is itself held in place by a shoulder on the armature shaft of the motor, which continually tightens by the turning force of the motor while it works. The cutters are said to follow every unevenness of the tube and remove all particles of scale polishing the tube surface smooth and bright. The use of longitudinal pivots insures parallel movement of the straight cutters against the surface of the boiler tube, and each tooth of all the cutters does its full share of work.

The sizing ring or hardened steel shield of the motor follows much closer behind the cutters than is possible, where the cutters are a full length of the arm

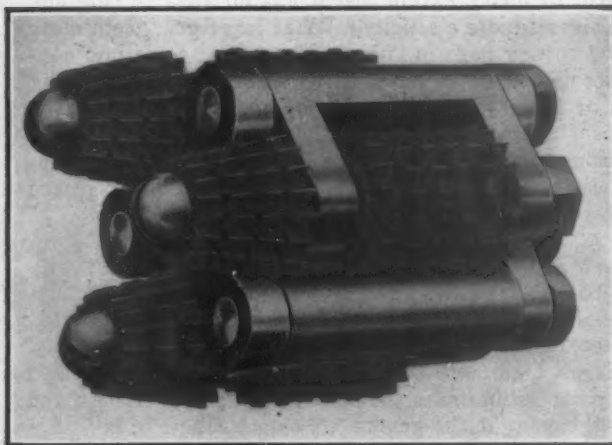


Fig. 1.—A New Boiler Tube Cleaner Head Made by the Roto Company, Hartford, Conn.

in advance of the head. The advantage of this construction is evident in greatly reducing the possibility of cutters passing over the scale which might obstruct the forward movement of the cleaner in the tubes. The spider is of high carbon steel, and is made in one solid piece. The central stem of the spider is of triangular section with concave sides to permit large cutters passing it easily, and has two end flanges to support the swing frames. The rear one has a solid hub threaded to screw on the motor shaft. A retaining ring fits over the hub, and holds the hexagonal

headed hinge pins in place. These are designed to fit in any one of six angular positions, thus giving six different positions of wear. The cutter pins are supported near both ends in solid steel swing frames which prevent twisting, binding and wearing of the pins in the frames and screw against the shoulder in the direction of their tendency to rotate while at work.

Rivetless construction is used throughout and all the parts are hardened. There are no pins, trunnions or other small parts to work loose and cause trouble, and to take the head apart without tools it is simply necessary to unscrew it from the motor shaft, and the retaining ring and hinge bolts will then slide out. The

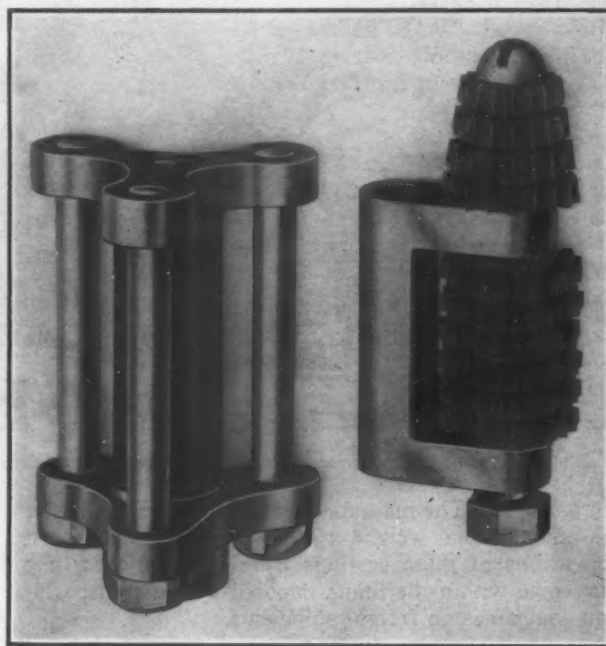


Fig. 2.—View Showing the Spider and One of the Swing Frames.

only wearing parts of the head are the cutter wheels and pins which are very hard, and can be cheaply renewed when they wear out. The capacity of this new head can be judged from the following data referring to a fully armed standard Roto cleaner head for 4-in. boiler tubes. Each arm is equipped with 11 parallel cutters and 1 cone cutter, giving a total cutting length for the three arms of over 8 in. The cutters are 1¼ in. in diameter or larger, and the minimum outside diameter of the head and cutters is 3 in. The total weight of the cutter, when completely equipped, is 4¼ lb.

That boiler owners who have bad water to contend with realize that scale and corrosion stand for waste and expense is evidenced by the number of orders for the Scaife and We-Fu-Go water softening and purifying systems placed with the Wm. B. Scaife & Sons Company, Pittsburgh, Pa., in addition to orders for the We-Fu-Go system for the purification of water for textile, laundry and other uses. Among some of its recent orders are the following: Josephine Furnace & Coke Company, Josephine, Pa., 7000-hp. We-Fu-Go; American Sheet & Tin Plate Company, Wellsville, Ohio, 2500-hp. We-Fu-Go; Pennsylvania Steel Company, Lebanon, Pa., 9000-hp. We-Fu-Go.

The Tropenas Steel Company, New Castle, Del., has disposed of its plant to the Edgar Allen American Manganese Steel Company of Chicago, which will adapt the plant to the manufacture of manganese steel castings. The Tropenas Steel Company will continue to manufacture its line of Tropenas converters at the New Castle plant, although it is not unlikely that the main office of the company will be removed to New York City.

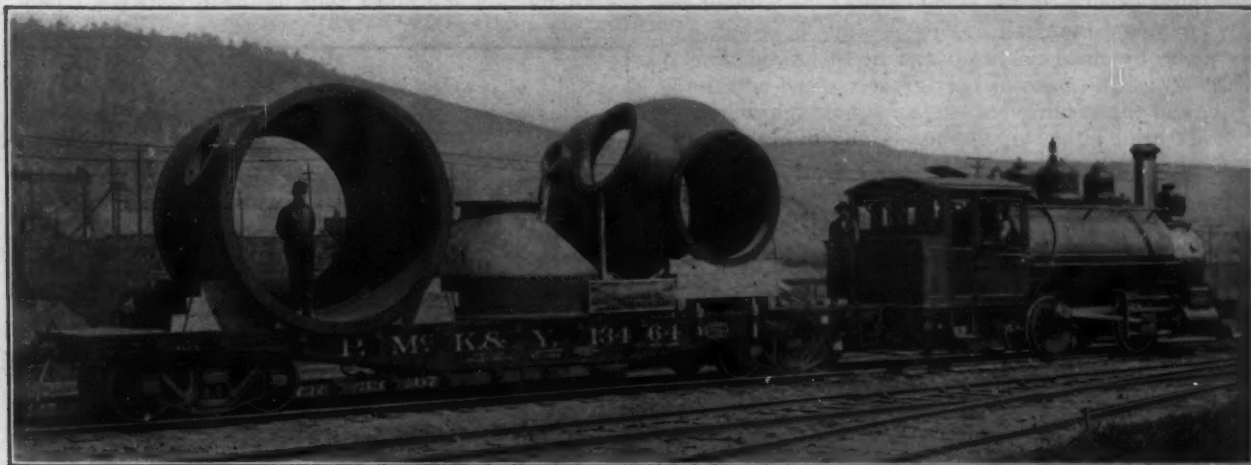


## A Large Mesta Helander Condenser

In the accompanying illustration the vessel for a large Helander condenser recently shipped by the Mesta Machine Company, Pittsburgh, Pa., to the Tennessee Coal, Iron & Railroad Company, Ensley, Ala., is shown leaving the maker's plant. This condenser, which is the largest ever built, is of the patent barometric type, and is designed to take care of the exhaust from 18 blowing engines, having a combined capacity

and is driven through double reduction gears by an induction motor.

Cut steel pinions and cast iron gears were originally installed, but on account of the extreme lightness of the pump there was considerable spring in both the shaft and the frame. This resulted in the gears continually breaking, and, in addition to the expense of renewing the gears, there was waste of power, due to running the engine non-condensing while the pump was being repaired. The use of rawhide pinions was suggested to the chief engineer as a remedy for these



The Largest Condenser Ever Built, Weight 190,000 Lb., Leaving the Plant of the Mesta Machine Company, Pittsburgh, Pa.

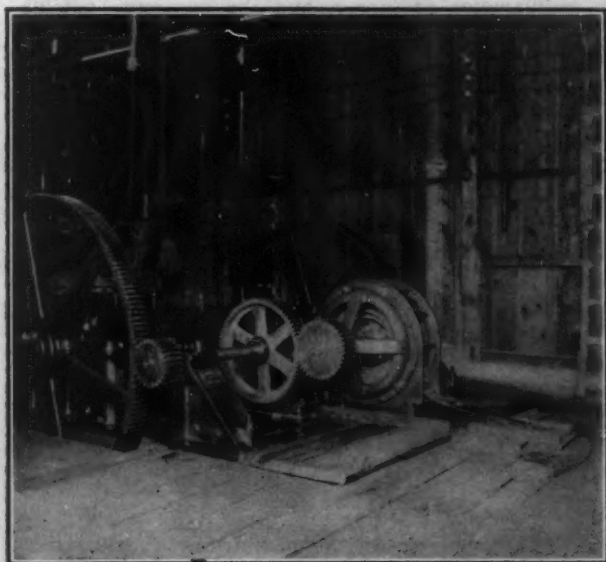
of 20,000 hp. The main diameter of the castings is 132 in., and the total weight, 190,000 lb. The weight and dimensions of these castings were so large that they just came within the limits imposed by the transportation companies on freight shipments.

## A Motor Drive Improved with Rawhide Pinions

The majority of rawhide pinions in use at the present time are on high speed drives, as the stopping of noise is generally considered to be one of their special advantages. Pinions of this material have, however, been found beneficial on gear drives, where irregularity in the load or other causes produce vibration. A very

troubles, and four New Process pinions made by the New Process Rawhide Company, Syracuse, N. Y., were substituted for the steel ones formerly used. In the accompanying illustration two of these pinions are shown, one on the end of the motor armature shaft and the other meshing with the large gear at the left. The other two are on the opposite side of the motor, and are symmetrically located with respect to those shown. These pinions were put into service more than two years ago, and since that time it is stated that the pump has been out of service only long enough to replace the rubber valves and repack the plungers.

Properly cured and machined rawhide can be fashioned into a gear or pinion that is practically the equivalent of metal, except that it has no metallic ring and possesses more elasticity. When large gear teeth mesh and cutting tools in lathes, planers, &c., come into contact with work, a shock is sustained, and this elasticity is of great advantage in motor and other drives, as it absorbs this shock. Another advantage is that it cushions the irregularity of the load due to the reciprocating movement of parts in machine tools or geared power plant apparatus.



A Pump Motor Drive Using Rawhide Pinions, Made by the New Process Raw Hide Company, Syracuse, N. Y.

good example of this latter use in the 1750-gal. quintuplex pump in the power plant of the Parral Power & Reduction Company, Parral, Chihuahua, Mexico, which is shown in the accompanying illustration. This pump furnishes the circulating water for a condenser,

W. B. Parker, for many years manager of the city department of the Biddle Hardware Company, Philadelphia, and E. W. Haines, who has for a long period represented the Whitman & Barnes Mfg. Company, Akron, Ohio, in the Philadelphia territory, have formed a partnership under the name of Parker & Haines, and will engage in the general jobbing business in mill supplies and hardware, with headquarters at 512 Commerce street, Philadelphia. They will represent the Whitman & Barnes Mfg. Company and the Eagle Lock Company, Terryville, Conn.; in the Philadelphia district, carrying a full line of the former concern's small tools and mill supplies, and a complete line of the latter company's cabinet hardware and screws, in stock in their warehouse.

The Camden Iron Works, Camden, N. J., cast recently the largest gray iron casting ever made at that plant. The weight was 55 tons, the casting being 26 ft. long, 8 ft. wide and 5 ft. thick. It is for a part of a keel bending press being built for the Fore River Shipbuilding Company, Fore River, Mass.

# CURRENT METAL PRICES.

The following quotations are for small lots. Wholesale prices, at which large lots only can be bought are given elsewhere in our weekly market report.

## IRON AND STEEL— Bar Iron from store—

<b>Refined Iron:</b>	
1 to 1 1/4 in. round and square.....	Per lb 1.90¢
1 1/4 to 4 in. x 1/4 to 1 in. ....	Per lb 2.10¢
1 1/4 to 4 in. x 1/4 to 1 in. ....	Per lb 2.10¢
<b>Rods—</b> 1/2 and 1-16 round and square.....	Per lb 2.10¢
<b>Angles:</b>	
3 in. x 1/4 in. and larger.....	Cts Per lb 2.10¢
3 in. x 3/16 in. and 1/2 in. ....	2.35¢
1 1/2 to 2 1/2 in. x 1/4 in. ....	2.30¢
1 1/2 to 2 1/2 in. x 3/16 in. and thicker.....	2.10¢
1 to 1 1/4 in. x 3/16 in. ....	2.20¢
1 to 1 1/4 in. x 1/2 in. ....	2.30¢
1 1/2 x 1/4 in. ....	2.40¢
1 1/2 x 1/2 in. ....	2.50¢
1 1/2 x 3/4 in. ....	3.55¢
1 1/2 x 1 in. ....	4.55¢
<b>Tees:</b>	
1 in. ....	2.65¢
1 1/4 in. ....	2.45¢
1 1/2 to 2 1/2 x 1/4 in. ....	2.15¢
1 1/2 to 2 1/2 x 3/16 in. ....	2.35¢
3 in. and larger.....	2.15¢
<b>Beams.....</b>	2.10¢
<b>Channels, 3 in. and larger.....</b>	2.10¢
<b>Bands—1 1/2 to 6 x 3/16 to No. 8.....</b>	2.35¢
<b>"Burden's Best" Iron, base price.....</b>	3.15¢
<b>Burden's "H. B. &amp; S." Iron, base price.....</b>	2.95¢
<b>Norway Bars.....</b>	3.00¢

## Merchant Steel from Store—

Bessemer Machinery.....	per lb 1.00¢
Toe Calk, Tire and Sleigh Shoe.....	2.50¢@3.00¢
Best Cast Steel, base price in small lots.....	7¢

## Sheets from Store—

Black		
	One Pass, C.R.	R. G.
	Soft Steel.	Cleaned.
No. 16.....	Per lb 2.90¢	3.00¢
Nos. 18 to 21.....	Per lb 2.95¢	3.10¢
No. 22 and 24.....	Per lb 3.05¢	3.20¢
No. 26.....	Per lb 3.10¢	3.30¢
No. 28.....	Per lb 3.20¢	3.50¢

## Russia, Planished, &c.

Genuine Russia, according to assortment.....	Per lb 12 @ 14 1/2
Patent Planished, W. Dewees Wood.....	Per lb A, 10¢; B, 9¢ net

## Galvanized.

Nos. 14 to 16.....	Per lb 3.50¢
Nos. 22 to 24.....	Per lb 3.55¢
No. 26.....	Per lb 3.75¢
No. 28.....	Per lb 4.10¢
No. 30 and lighter 3/8 inches wide, 3/16¢ higher.	

## Genuine Iron Sheets— Galvanized.

Nos. 22 and 24.....	Per lb 5.75¢
No. 26.....	Per lb 6.25¢
No. 28.....	Per lb 7.25¢

## Corrugated Roofing—

2 1/2 in. corrugated.	Painted	Galvd.
No. 24.....	Per 100 sq. ft. \$3.85	4.80
No. 26.....	Per 100 sq. ft. 2.90	4.90
No. 28.....	Per 100 sq. ft. 2.60	3.75

## Tin Plates—

### American Charcoal Plates (per box.)

"A.A.A." Charcoal:	
IC, 14 x 20.....	\$6.35
IX, 14 x 20.....	7.00

### A. Charcoal:

IC, 14 x 20.....	\$5.40
IX, 14 x 20.....	6.50

### American Coke Plates—Bessemer—

IC, 14 x 20.....	\$4.40
IX, 14 x 20.....	5.40

### American Terne Plates—

IC, 20 x 28 with an 8 lb. coating.....	\$8.20
IX, 20 x 28 with an 8 lb. coating.....	10.50

## Seamless Brass Tubes—

List November 15, 1908.....	Base price 18¢
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## Brass Tubes, Iron Pipe Sizes—

List November 15, 1908.....	Base price 18¢
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## Copper Tubes—

List November 15, 1908.....	Base price 22¢
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## Brazed Brass Tubes—

List August 1, 1908.....	19 1/2¢ Per lb
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## High Brass Rods—

List August 1, 1908.....	14 1/2¢ Per lb
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## Roll and Sheet Brass—

List August 1, 1908.....	14 1/2¢ Per lb
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## Brass Wire—

List August 1, 1908.....	14 1/2¢ Per lb
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## Copper Wire—

Base Price.....	Carload lots mill 14 1/2¢
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## Copper Sheets—

Sheet Copper Hot Rolled, 16 oz (quantity lots) Per lb 18¢	
Sheet Copper Cold Rolled, 1¢ Per lb advance over Hot Rolled.	
Sheet Copper Polished 20 in. wide and under, 1¢ Per square foot	
Sheet Copper Polished over 20 in. wide, 2¢ Per square foot	
Planished Copper, 1¢ Per square foot more than Polished.	

## METALS— Tin—

Straits Pig.....	Per lb 34 1/2¢@35¢
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## Copper—

Lake Ingot.....	Per lb 14 1/2¢@15¢
Electrolytic.....	Per lb 14 1/2¢@15¢
Casting.....	Per lb 14 1/2¢@14 1/4¢

## Spelter—

Western.....	Per lb 8 1/2¢@8 1/4¢
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## Zinc.

No. 9, base, casks.....	Per lb 8¢   Open..... Per lb 8 1/2¢
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## Lead.

American Pig.....	Per lb 5¢@5 1/4¢
Bar.....	Per lb 6 1/2¢@6 1/4¢

## Solder.

5 & 5, guaranteed.....	Per lb 22 1/2¢@22 1/4¢
80-1.....	Per lb 18 1/2¢@18 1/4¢
Refined.....	Per lb 17 1/4¢@17 1/2¢

Prices of Solder indicated by private brand vary according to composition.

## Antimony—

Cookson.....	Per lb 1.10¢
Halletts.....	@10¢
Other Brands.....	@9 1/2¢

## Bismuth—

Per lb.....	\$2.00@2.25
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## Aluminum—

No. 1 Aluminum (guaranteed over 99% pure), in ingot for remelting.....	Per lb 24¢
Rods & Wire.....	Base Price 31¢
Sheets.....	Base Price 33¢

## Old Metals.

Dealers' Purchasing Prices Paid in New York	
	Cents
Copper, Heavy cut and crucible.....	Per lb 10.75¢@11.00¢
Copper, Heavy and Wire.....	Per lb 10.50¢@10.75¢
Copper, Light and Bottoms.....	Per lb 9.50¢@9.75¢
Brass, Heavy.....	Per lb 7.00¢@7.50¢
Brass, Light.....	Per lb 6.75¢@7.00¢
Heavy Machine Composition.....	Per lb 9.75¢@10.00¢
Clean Brass Turnings.....	Per lb 7.00¢@7.25¢
Composition Turnings.....	Per lb 8.00¢@8.25¢
Lead, Heavy.....	Per lb 3.50¢
Lead, Tea.....	Per lb 3.25¢
Zinc Scrap.....	Per lb 3.75¢

# Nicholson Files

Sales of good files should remind you  
You can all avoid a "rut" —  
Just by stocking up and selling  
Files like these that *always cut*.

Some Hardware merchants get in  
the "rut" of stocking any kind of  
files just because they are *cheap*. But  
such files don't *sell* and are "dead stock"  
on their shelves.

TRADE

NICHOLSON  
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MARK

Nicholson File Company, Providence, R. I.